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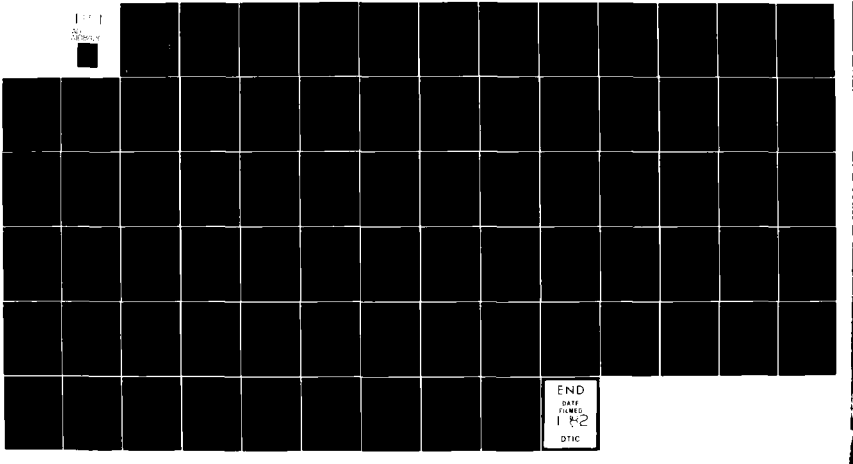

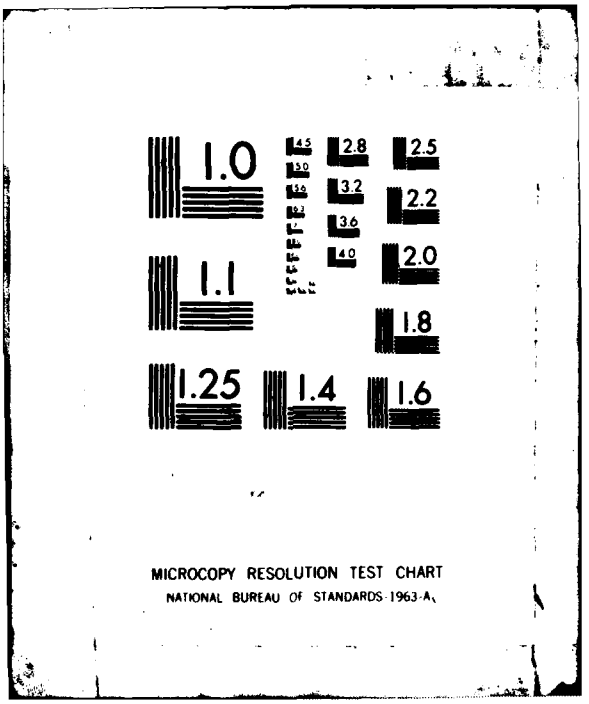
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A DIGITAL SIMULATION PROGRAM DESCRIBING THE MOTION OF AN AIRCRAFT UNDERGOING ENGINE FAILURE DURING ITS TAKEOFF GROUND ROLL

(12) 77

MICHAEL J. MIEDLAR
Flight Technology Division
Directorate of Flight Systems Engineering

Final Report
September 1981

Approved for public release; distribution unlimited.

DEPUTY FOR ENGINEERING
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report presents a non-interactive "MIMIC" program developed to generate the time history of an aircraft undergoing an engine failure during its ground roll. The program calculates the forces and moments acting on the aircraft, and uses MIMIC's implicit integration routine to track its motion. The equations and assumptions used are presented and discussed. This report also lists the program and delineates its functions.

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FOREWORD

This report, "A Digital Simulation Program Describing the Motion of an Aircraft Undergoing Engine Failure During its Takeoff Ground Roll," describes the primary actions of the program ENGOUT, and serves as a User's Guide for the program. This program was written to give stability and control engineers a tool to predict the ground minimum control speed of a multi-engined aircraft. The work resulting in this report was begun in June of 1980 and completed in March of 1981 by Mr Michael J. Miedlar, Project Engineer, Flight Stability and Control Branch (ASD/ENFTC). This report was submitted by the author in July of 1981.

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INTRODUCTION

The problem of engine failure during takeoff enters into the design phase of all multi-engined aircraft. Ground minimum control speed (V_{mc_g}) has a direct impact on sizing the vertical tail, the rudder and its deflection authority, as well as on any directional stability augmentation system. The difficulty associated with this problem arises from the estimation of landing gear tire friction and reaction forces. These forces depend on factors such as runway surface condition, speed, and airplane weight.

This report is intended to serve as an introduction to the program "ENGOUT", which solves this problem. This program, written for use on a "MODCOMP CLASSIC" digital computer, generates a time history which describes the forces, moments, and motion resulting from an engine out condition during the takeoff ground roll. This program will analyze any airplane which has a nose wheel landing gear bogie and up to four main gear bogies. "ENGOUT" will accept as many as four engines, located anywhere on the structure. Any combination of these engines may fail, at the same time, at any speed during the ground roll. Crosswind may be entered as a ramp or a step function from either side of the runway. Center of gravity, gross weight, runway condition, and pilot reaction time are all variable.

The program, written in the "MIMIC" programming language for the KC-135 re-engining project, has been generalized to enable it to analyze a wide variety of aircraft and takeoff conditions. A brief description of "MIMIC" is given in Appendix A.

SECTION II

USING ENGOUT

ENGOUT generates the time history of an aircraft during a takeoff ground roll. The user may choose to fail an engine at any speed during the ground roll, and the program will predict the trajectory of the aircraft. The plane yaws in the direction of the failed engine, and a simulated pilot enters control to return the aircraft to its original flight path. ENGOUT follows the aircraft to rotation speed if no failure occurs, or to the maximum point of deviation following an engine failure. Although able to analyze a routine takeoff roll, ENGOUT is primarily intended for use as a tool in determining V_{mc_g}, the ground minimum control speed.

The ground roll does not need to start at zero velocity, ENGOUT has the capability to begin at any speed less than or equal to the speed at which failure occurs. Any speed of crosswind may be entered as a ramp or step function at any value of forward speed, from either direction. Thrust is a function of speed, and the program provides the capability to simulate nonlinearities in this function. The program also has capability to describe the dependency of maximum rudder deflection on aircraft speed. The program has enough flexibility to account for a great variety of phenomena.

ENGOUT can analyze almost any conceivable takeoff condition. Variable parameters include crosswind, center of gravity, gross weight, runway surface condition, failed engine spin down time constant, or any other aircraft parameter of interest. Written in the hybrid language MIMIC, this program manipulates forces and moments to calculate linear motions in the X and Y inertial runway directions and angular motions in the roll and yaw planes. Using MIMIC's implicit integration routine, it integrates these accelerations to determine the velocities in the X and Y directions, the roll rate, and the yaw rate. Integrating again, ENGOUT calculates the X and Y distances, the roll angle ϕ, and the yaw angle ψ. It takes into account all aerodynamic forces and moments, as well as all reactions and friction forces acting on the landing gears. While on the ground, an aircraft does not translate in the Z direction, nor does it pitch. ENGOUT solves the four degree of freedom problem of an aircraft during its ground roll.

ENGOUT provides input and output variable dictionaries. The user enters data for the problem of interest. This is done by the techniques used in MIMIC as described in appendix A. The data must be entered in the MIMIC format, and in a particular set of units. All lengths must be in feet. Enter all areas in

ft^2, all angles in degrees, and all inertias in slug/ft^2. Mass should be in slugs, density in slugs/ft^3, time in seconds, and velocity in knots. ENGOUT works with all stability and control derivatives in 1/rad. The program works with data as though entered in these units, so the user will need to ensure the accuracy of the dimensions of his data.

When obtaining geometric data for the aircraft of interest, use a three view drawing which describes the vehicle in fuselage stations, butt lines, and water lines. The program manipulates these terms to obtain the necessary moment arms. One term will present some difficulty, the fuselage station of each engine. This term describes the point at which the vertical component of an engine's thrust acts in the pitch plane. The engines attach to the structure in some way, and the vertical thrust component transmits a pitching moment thru this structure. This moment arm defines the fuselage station of the engine. All fuselage stations, water lines, and butt lines should be entered in feet.

The program looks for data on four main gear bogies and four engines. If the airplane being analyzed does not have these components, enter a zero for any parameter to do with the component. The program has logical controls to account for this option.

ENGOUT returns information in a particular set of units also. All angular measures output in degrees, and all linear measures in feet. All forces will have units of pounds. Logical terms are non-dimensional. Any output variables pertaining to components not present on the aircraft will have values of zero. The only exception to this is logical control variables for non-present components. Some of these will have a true value of one, and some the false value zero. The program itself determines the value, which will depend upon the use of the variable. The variables listed in the output dictionary are recommended to the user as completely able to describe the trajectory of the aircraft. Of course the actual output terms are at the discretion of the user.

ENGOUT works like a black box. The user puts in data and gets back information describing the trajectory of the aircraft. The following sections of this report describe the main actions of the program. It looks inside of the black box. Appendix B lists the program, and shows a complete run for a certain set of data.

SECTION III

GROUND MINIMUM CONTROL SPEED

From being initially at rest, an aircraft will accelerate down the runway under takeoff power. After reaching V_s, the stall speed, the aircraft is capable of flight, but the pilot will not begin rotation until the aircraft has accelerated past the critical engine failure speed, V_1. The critical engine failure speed is the maximum speed at which the pilot can control the aircraft after the failure of a critical engine and either takeoff or bring the aircraft to a stop within the runway available. Above this speed the pilot will rotate the aircraft and lift off.

Safe takeoff procedure requires that the pilot knows the critical engine failure speed. However, a more crucial parameter to the design engineer is the ground minimum control speed, V_{mc_g}. This is the minimum speed at which, if a critical engine fails, the pilot should be able to regain control of the aircraft within a certain specified deviation from the runway centerline, and continue the takeoff. Normal design procedures require V_{mc_g} to be less than or equal to V_1.

Naturally, a low V_{mc_g} is very desirable, so a manufacturer will do all he can to minimize this speed. By choosing a favorable takeoff condition, the minimum control speed may indeed appear very low. But a seemingly inconsequential change in one of the factors involved in the analysis may have significant impact on its results.

An engine failure aggravates the already complicated problem of takeoff analysis. The reaction forces on the landing gear tires must be calculated accurately to ensure a proper result. Entities such as airplane gross weight, center of gravity position, runway surface condition, and even crosswind velocity all influence these reactions. Each of these factors must enter into any analysis of the phenomenon.

By far, the time for pilot reaction has more impact than any other factor. The faster he reacts to the failure, the more controlled the motion will seem, and in fact will be. Controversy rages around this time delay, and no standard has yet been universally agreed upon. A small change in reaction time may result in a large change in aircraft motion, and give the appearance of better performance.

One manufacturer tries to get around this problem by installing a special sort of directional stability augmentation system. In effect, the aircraft itself reacts to the failure, and puts in some control. The re-engined KC-135 aircraft is now equipped with

engine failure command augmentation, and this type control input must also be accounted for in an analysis of V_{mc_g}, as well as the action of a standard directional augmentation system as installed on most large aircraft.

These factors all interconnect to make the problem a most difficult one to solve. The input parameter of primary interest is the speed at which the engine fails, and the output parameter of especial interest is the deviation from the runway centerline, since these are what define the minimum control speed. V_{mc_g} is the speed at which a critical engine failure can occur, and after a reasonable time delay, the pilot can control the aircraft before it has strayed a specified distance from the runway centerline. A critical engine is defined as that engine whose failure would cause the largest yawing moment, that is, the most outboard engine, since engines are mounted symmetrically in the yaw plane.

The calculation of V_{mc_g} involves these factors, and many others. To solve this problem, the forces and moments acting on the aircraft have to be computed, and integrated for its motion. The ground physically restricts the vertical motion of the landing gear wheels, and the gear bogies are assumed to be rigid. The pitch attitude is held constant. Therefore, the aircraft has four degrees of freedom, and these motions all contribute to the total motion of the stricken vehicle.

SECTION IV

CALCULATION OF TIRE NORMAL WHEEL FORCES (F_Z)

During any ground roll, the forces acting on the landing gear tires of an aircraft greatly affect its trajectory down the runway. Normal forces support its weight, rolling friction acts as a drag, and side forces oppose translation to either side. These frictions and reactions also oppose any rotation of the aircraft, which directly influences the aircraft motion.

Of primary importance are the gear reaction forces, the normal forces which support the weight. These reactions enter into the calculation of the friction forces, and prevent an aircraft from pitching during a ground roll. These reactions depend on center of gravity location, since all forces and moments can be visualized as acting at the center of gravity. Proper manipulation of these forces and moments leads to the calculation of the gear reaction.

ENGOUT uses a basic equation commonly known as the three moment equation, to calculate these reactions. It describes the relationship between the internal bending moments at three consecutive points of support on a beam continuous over three or more supports, as shown in figure 1, under any external loading condition. This equation is used in conjunction with statics to determine reaction forces for a statically indeterminate beam.

Assuming that the landing gears act in the pitch plane as a series of simple support, the use of this equation is valid. In the pitch plane, gears with the same fuselage station have the same moment arms, and act as one. In general, this will reduce the number of supports to two if the aircraft has one pair of main gear bogies, or three if it has two pairs of main gear bogies. Because gear bogies with the same fuselage station may be combined into one support, aircraft are built with landing gear bogies symmetrically placed about the fuselage centerline.

Applying this assumption, an aircraft resembles a simply supported rigid beam, making it possible to calculate the normal reactions. Two equations available from statics are the summation of moments in the pitch plane and the summation of forces in the vertical direction. If the plane has two points of support, specifically a nose gear logic and two main gear bogies acting together, these are sufficient to calculate the reactions. However, three points of support, a nose gear bogie and two sets of main gear bogies, require an additional equation, the three moment equation.

Figure 1

Beam Continous Over Four Supports

Consider the beam continuous over three supports shown in figure 2. M_A, M_B, and M_C represent the bending moment at each of the supports due to any potential loading of the entire beam. F_i and F_j represent any potential loading condition acting on the partial spans L_1 and L_2. This method treats each length of beam L_1 and L_2 independently from the rest of the beam. Each length of beam has an associated bending moment diagram generated by the particular loading condition acting on it alone. Suppose that the bending moment diagrams have an abritrary shape as shown in figure 3.

A_i and A_j represent the areas associated with the bending moment diagrams of each segment. $\bar{a}_i$ and $\bar{b}_j$ are lengths from the indicated ends to the geometric centroid of each area. Based on these parameters, the three moment equation as listed in reference 5 is given by equation (1).

$$M_a L_1 + 2 M_b (L_1 + L_a) + M_c L_2 = - \sum_{i=1}^{m} \frac{6 A_i \bar{a}_i}{L_1} - \sum_{j=1}^{n} \frac{6 A_j \bar{b}_j}{L_2} \qquad (1)$$

"m" and "n" are the number of distinct loads acting on each length of beam. For a beam with more than three points of support, this equation can be repeated as many times as necessary to include the bending moments a teach support along the entire beam, taking three adjacent supports each time. These equations can be solved simultaneously to determine the bending moments at each support. These moments, along with the equations for summation of forces and moments, can be used to calculate the normal reaction forces at each support.

Depending on the loading condition, the three moment equation takes on special forms. Suppose that the loads consist of concentrated vertical forces as shown in figure 4. Reference 5 shows the derivation for this special form of the three moment equation for this loading condition as given by equation (2).

$$M_a L_1 + 2 M_b (L_1 + L_2) + M_c L_2 = - \sum_{i=1}^{m} \frac{P_i a_i}{L_1} (L_1^2 - a_i^2) - \sum_{j=1}^{n} \frac{P_a b_j}{L_2} (L_2^2 - b_j^2) \qquad (2)$$

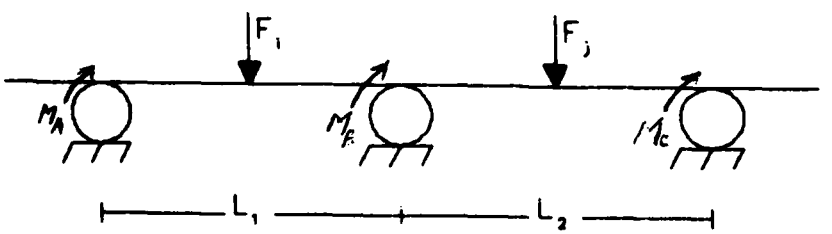

FIGURE 2
Beam Continuous Over 3 Supports, Under Loading

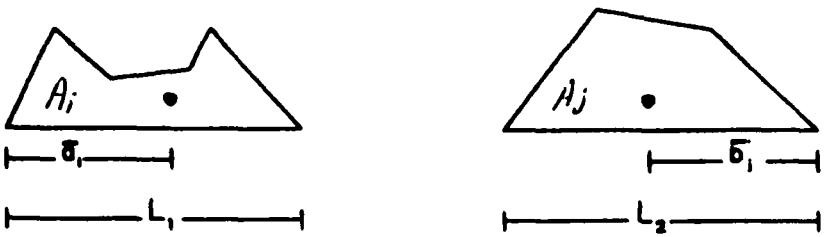

FIGURE 3
Hypothetical Bending Moment Diagram

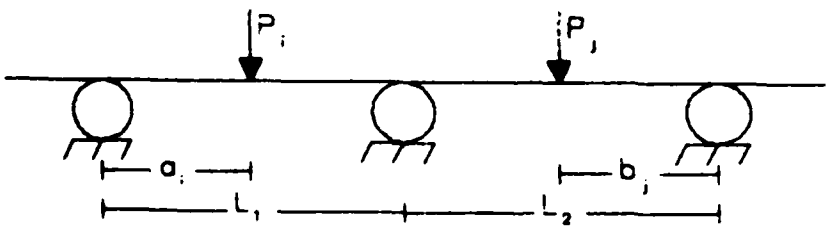

FIGURE 4
Continuous Beam Loaded By Concentrated Forces

The summation sign includes all concentrated loads on each length of beam. a_i and b_j are not measured to the centroid of the bending moment diagrams but from the indicated end to the point of action of the load.

Suppose that a beam is loaded by distributed vertical forces as shown in figure 5. W_1 and W_2 are the intensities acting on each span. Reference 5 derives this special form of the three moment equation:

$$M_a L_1 + 2 M_b (L_1 + L_2) + M_c L_2 = - \sum_{i=1}^{m} \frac{W_i L_1}{4} - \sum_{j=1}^{n} \frac{W_j L_2}{4} \qquad (3)$$

The summation includes all distributed forces acting on each span.

Figure 6 shows a beam loaded by pure moments M_i and M_j. The special form of the three moment equation for this loading was derived by the author in the same way that reference 5 did for the previous forms, and is given by equation (4).

$$M_a L_1 + 2 M_b (L_1 + L_2) + M_c L_2 = - \sum_{i=1}^{m} \frac{M_i}{L_1^2} (L_1^3 - 3 a_i L_1 + 4 a_i^3) - \sum_{j=1}^{m} \frac{M_J}{L_2^2} (L_2^3 - 3 b_j L_2 + 4 b_j) \qquad (4)$$

Once again, the summation includes all pure moments acting on each span. An aerodynamic pitching moment is an example of a pure moment.

These three special forms can be combined to include as many loading conditions as necessary. This combined special form of the three moment equation, taking into account all concentrated vertical forces, distributed vertical forces, and pure pitching moments is given in equation (5).

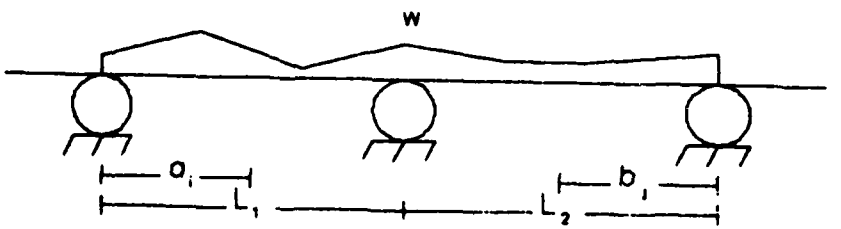

FIGURE 5
Continuous Beam Loaded By Distributed Forces

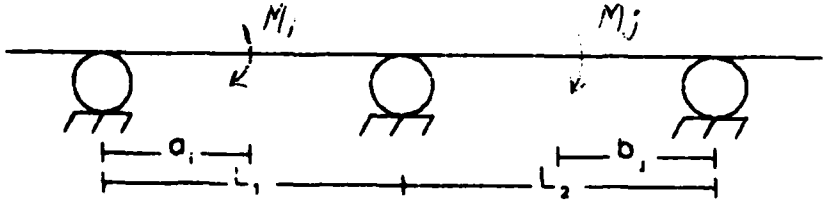

FIGURE 6
Continuous Beam Loaded By Concentrated Moments

$$M_a L_1 + 2M_b (L_1 + L_2) + M_c L_2 = \left(-\Sigma \frac{P_i a_i}{L} (L_1^2 - a_i^2) - \Sigma \frac{P_j b_j}{L_2} (L_2^2 - b_j^2)\right.$$

$$+ \left(- \Sigma \frac{W_i L_1}{4} - \Sigma \frac{W_i L_2}{4}\right)$$

$$+ - \Sigma \frac{M_i}{2} (L_1^3 - 3 a_i^2 L_1 + 4 a_i^3) \qquad (5)$$
$$L_1$$

$$- \Sigma \frac{M_i}{2} (L_2^3 - 3 b_i^2 L_2 + 4 b_i^3)$$
$$L_2$$

ENGOUT manipulates this expanded form of the three moment equation to compute the normal reaction forces acting on an airplane's landing gear. If the aircraft has only two points of support, each term reduces to zero, and the equation loses all significance; the program uses a simple summation of forces and moments to calculate reaction forces. However, for three points of support, ENGOUT calculates the appropriate terms for each given loading condition. Unnecessary terms are reduced to zero.

Statics simplifies this process since all forces can be replaced by an equivalent force-moment system acting at a different point. Lift, weight, and drag, actually distributed forces, can be transformed into three single concentrated forces and one combined pitching moment acting at the center of gravity. Thrust, split into its vertical and horizontal components, converts to a set of concentrated vertical loads and pure pitching moments. The inertial reaction force also acts as a pure pitching moment at the center of gravity.

ENGOUT manipulates these forces and moments into convenient forms. M_A, the bending moment at the nose gear, is assumed to be zero. This is valid since, having concentrated the weight at the center of gravity, no forces or moments act forward of the nose gear.

"ENGOUT" calculates M_C, the bending moments at the aft main gear, by equating it to the summation of moments aft of that set of gears. It then combines M_C with the load terms from the right side of equation (5) to determine M_B, the bending moment at the forward main gear.

Having calculated the bending moments at the three gear positions, it is a simple matter to calculate the reaction forces. Summation of bending moments forward of the main forward gear furnishes the nose gear force. Summation of bending moments forward of the aft main gear produces the reaction at the main forward gear position, and summing the vertical forces gives the main aft gear reaction force.

Although forces at the same fuselage station act together in pitch, they will not do so in roll since they will be located at different butt lines. The roll moment arms will be different. This requires the division of the reaction force between the separate elements of the support.

An airplane's main gear supports consist of two bogies, symmetrically positioned below the fuselage centerline. The nose gear will have only one bogie. This splitting of the reaction force is accomplished by estimating equivalent spring force and damping coefficients for each pair of bogies. These components will act to oppose a rolling motion while the wheels are in contact with the ground. Also, the center of gravity may not necessarily be positioned on the fuselage centerline. Letting "FZMA" represent the total force on the main aft support position, the reactions on each bogie is given by equation (6).

$$F_{Z_{MAR}} = \frac{BLCG - BLMAL}{BLMAR - CLMFR} * F_{Z_{MA}} + K * (BLMAR - BLCG) * PHI + B (BLMAR - BLCG) * P$$

$$F_{Z_{MAL}} = F_{Z_{MA}} - F_{Z_{MAR}} \qquad (6)$$

"BLCG" represents the butt line of the center of gravity position, "BLMAL" and "BLMAR" the butt lines of the main aft right and left gears, "K" the equivalent spring force coefficient, "B" the equivalent damping coefficient, "PHI" the roll angle, and "P" the roll rate. The corresponding terms yield the separate reactions for each main forward gear bogie.

ENGOUT will perform these actions, thus delivering an entire set of landing gear reactions. The equations necessary for this procedure have been sufficiently generalized to enable the user to analyze any aircraft with a nose gear and one or two sets of main gear bogies.

SECTION V

ROLLING AND SIDE FRICTION FORCES

During ground roll, an aircraft's low speed greatly reduces its aerodynamic effectiveness, and magnifies the effect of friction forces acting on the landing gear tires. Accurate prediction of its trajectory requires the proper calculation of these forces. The nature of friction makes an exact analysis impossible without detailed knowledge of the properties of the tire in question. However, it is possible to give a good approximation to these forces by making certain assumptions.

Rolling friction (F_X) presents little difficulty. Fully inflated tires deform under loading in a characteristic manner, and a rolling friction coefficient of 0.025 will usually be sufficient to describe the phenomenon. The rolling friction force is the product of the normal force and the rolling friction coefficient.

$$F_X = \mu_R * F_Z \qquad (7)$$

The rolling friction acts at the bottom of the tire, in the direction opposite to that of the roll.

Side friction force (F_Y) does not lend itself to solution quite so easily. This force depends heavily on runway surface condition, tire yaw angle, ground speed, and the normal force. The tires also react against the side forces acting on the aircraft, and if the tire skids, these equations are invalid. The problems all depend on the tire being used.

However, some of these problems can be disregarded. The reliance on tire yaw angle can be approximated as linear if the yaw angle remains sufficiently small, below 5 degrees. Only test data can provide totally accurate answers in this region, but a linear approximation is a good one.

Dependency on tire normal force can be ignored if the yaw angle is small enough. This is the cause of the approximate linearity at low yaw angles.

As long as a tire does not skid, it will react against the side forces acting on the aircraft. It will skid if the side forces exceed the maximum static friction force. This maximum is given by the product of the static coefficient of friction and the normal force acting on the tire. If the tire

skids, the reaction force is zero and the kinetic friction force takes over. This force is obtained by multiplying the kinetic friction coefficient with the normal force. Reference 6 presents a mathematical approach to landing gear ground reactions for a general aircraft, and includes these equations to calculate static and kinetic friction coefficients.

$$\mu_K = \mu_{S_{MAX}} - 0.0053 * V_G \tag{8}$$

$$\mu_{S_{MAX}} = 0.0392 * RCR - 0.102 \tag{9}$$

These equations take into account the dependency on the runway condition reading (RCR), which measures the runway condition from four for an ice covered runway to 23 for a dry hard one, and V_G, the ground speed in knots. Each coefficient has a lower limit of 0.044.

ENGOUT calculates the side forces acting on a tire using these assumptions and equations. It has logical control to determine when the side forces acting on the airplane become great enough to skid the tires. In this case, the side friction force is set equal to the kinetic friction force.

The friction acting on an unskidded tire consists of two parts, a reaction due to the side forces on the aircraft and scrubbing forces arising from the yaw angle of the tire. Each tire reacts the same fraction of total aircraft normal force and total aircraft side force. The total side force includes aerodynamic side force and centrifugal force rising from yaw velocity.

The scrubbing friction force is the product of the tire normal force and the scrubbing friction coefficient. The scrubbing coefficient is calculated by multiplying the kinetic friction coefficient by a factor which takes into account the approximate linear dependency of friction with tire yaw angle. This factor is determined by dividing the tire yaw angle by eight, the maximum angle for which the linear profile is valid. The tire yaw angle is given by:

$$\psi_{TIRE} = TAN^{-1} \frac{V}{U} + L_X * R/U \tag{10}$$

"V" represents linear velocity in the Y-direction; "U" linear velocity in the X-direction; "L_X" the distance in the X-direction from the center of gravity to the center of the tire, positive if the tire is forward of the center of gravity, negative if aft; and "R" the yaw velocity in radians per second.

These assumptions and equations give a good approximation of the tire friction forces. As the aircraft approaches liftoff speed, the effect of ground friction diminishes greatly. However, below ground minimum control speed, these forces have an important impact on an aircraft's motion.

SECTION VI

DIRECTIONAL CONTROL

During a takeoff ground roll, a pilot holds his wings level and keeps the aircraft on the runway center line by making small corrections to his lateral-directional control positions. These controls consist of ailerons and/or spoilers, considered together in wheel/stick position, rudder, and nose wheel steering controlled either thru the rudder pedals or with a tiller. Basically, the pilot continually retrims the aircraft directionally while on the ground.

When an engine fails, its thrust spins down to zero exponentially and wind milling of the propeller or fan adds drag which rises exponentially to a steady state value. These exponentials have the same time constant. This results in a thrust imbalance in the yaw plane, causing the aircraft to nose around in the direction of the failure.

An aircraft equipped with a stability augmentation system senses instantly the motion caused by the failure and puts in rudder deflection to oppose the yaw motion. The amount put in and how fast it goes in depend on the system installed, but this sort of system will put in some control with no recognition or reaction time.

A pilot needs some finite time to recognize, and react to, the situation. He then commands the full directional control available. He continues to trim the aircraft laterally, but puts in full rudder and full nose wheel steering. He holds full control in until he once again aligns the aircraft along the runway.

The authority and effectiveness of these control systems all depend on the aircraft being analyzed, but ENGOUT expands and generalizes some factor to cover all aircraft. Totally aircraft dependent features, such as an augmentation system, can be inserted later by the user.

The pre-failure, or trimming, part of this control is simple. Laterally, the pilot continually enters sufficient wheel deflection to keep the wings level. The block diagram of figure 1 describes this action.

The gains K_p and K_ϕ depend on the aircraft aerodynamics, but values of 15 for each should be close. ENGOUT models this block diagram to laterally simulate a pilot. This "pilot" senses and responds to the rolling motion experienced during the ground roll. P and ϕ influence $\dot{P}$ by affecting the tire forces. Figure 7 does not reflect this, since it only describes the pilot lateral control action, valid for the entire ground roll.

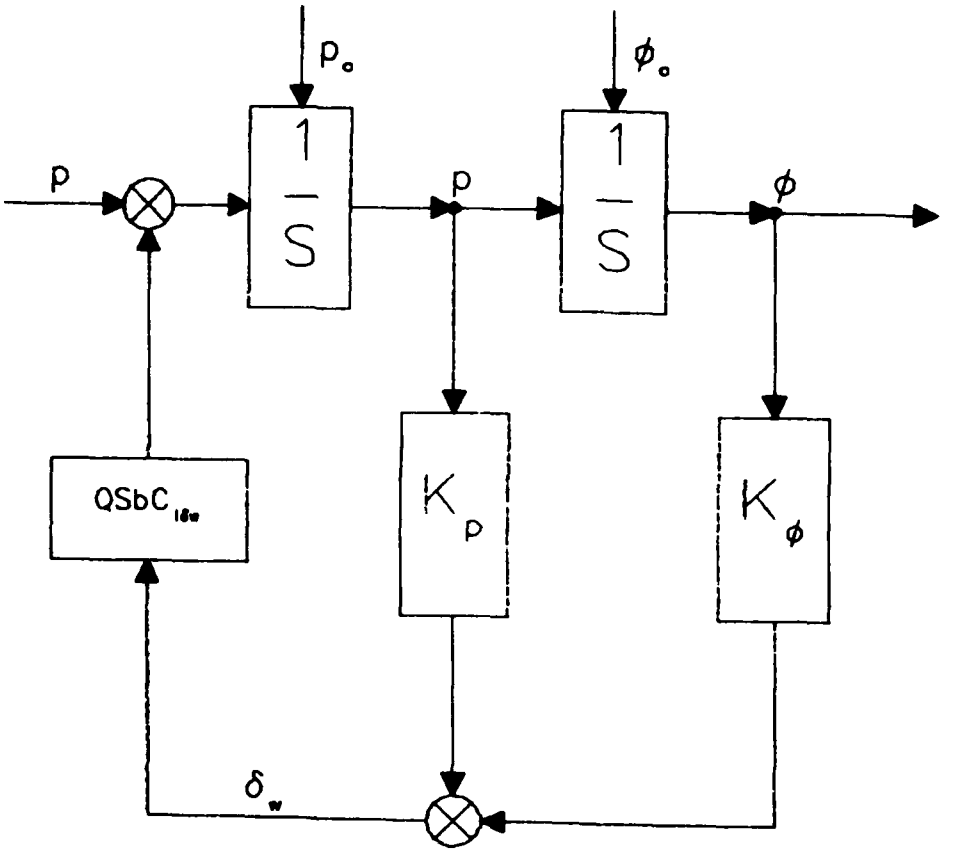

FIGURE 7
Lateral Trim Block Diagram

Before failure, the directional trim "pilot" works the same way, but instead of "reacting to" the angular rate and angle and entering the appropriate rudder and nose steering control, ENGOUT's "pilot" reacts to the side velocity and displacement. This block diagram is shown in figure 8.

As before, the aircraft configuration determines the values of K_y and K_y. G_{δ_y} represents a transfer function for converting directional control to a side acceleration. ENGOUT acts in such a way as to provide this transfer function. This block diagram describes the "pilot" rudder and nose wheel input prior to an engine failure. If the "pilot" deflects both rudder and nose wheel by moving the rudder pedals, δ_{ns} will equal δ_r times a factor equal to the maximum nose steering angle available divided by the maximum rudder deflection available. If a tiller controls the nose wheel angle deflection, each system will need its own value of K_y and K_y.

After losing an engine, the pilot still holds his wings level, and the lateral control block diagram requires no additions or changes. However, after recognizing the situation, the pilot puts in full directional control in opposition to the yaw motion of the aircraft created by thrust imbalance. Once again, the same block diagram will describe both rudder and nose wheel steering systems, as shown in figure 9. If both rudder and nose wheel are controlled thru the rudder pedals, the steering angle may equal the rudder angle multiplied by the ratio of maximum nose wheel input to maximum rudder delfection. This will result in maximum nose steering occuring at the same time as maximum rudder input. If desired, the program will put in maximum nose steering at a different time than maximum rudder.

An augmented aircraft will have a lower value of minimum control speed than one without such a system. The augmentation system puts in rudder to oppose a yawing motion instantly, decreasing the effect of the delay between engine failure and pilot reaction. It is usually designed with some sort of washout to ensure that it does not oppose pilot actions. The nature of those systems, generally referred to as yaw dampers, is not at all general in nature, and will be different for each aircraft. ENGOUT contains a simple system which equates yaw damper input to a gain times yaw rate plus a gain times yaw angle plus a gain times sideslip angle. If a different or a more complex system is needed, the necessary terms will have to be inserted by the user.

An accurate engine failure simulation cannot be accomplished without proper simulation of the control system of the aircraft. Unlike the similarity of the landing gears for most aircraft, the control system for each type of vehicle is unique. Especial care should be taken in modeling these systems.

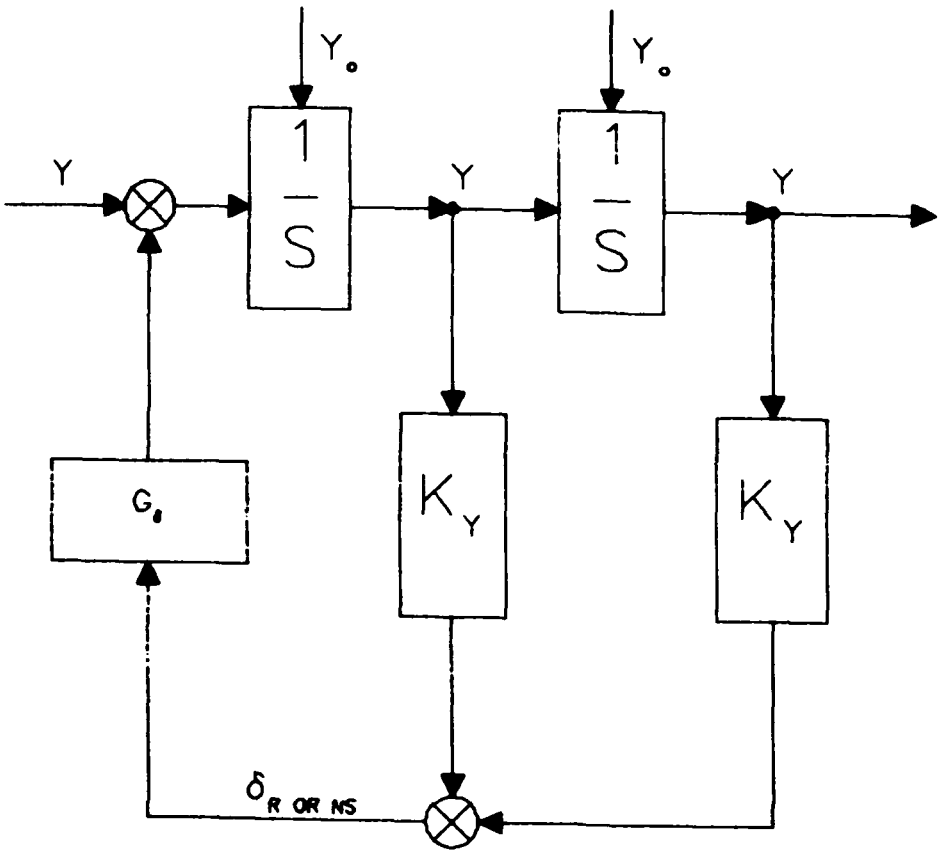

FIGURE 8
Directional Control Block Diagram

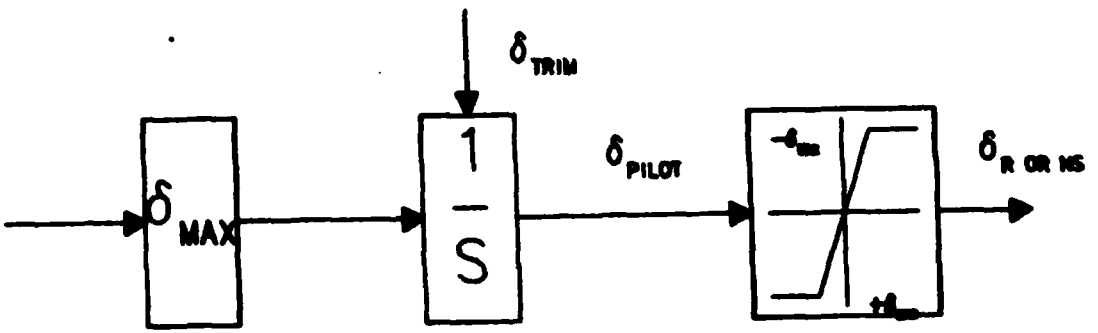

FIGURE 9

Pilot Directional Control After Failure

APPENDIX A - MIMIC

The program ENGOUT uses the hybrid language MIMIC, a language which combines the speed of a digital computer with the programming ease of an analog system. It eliminates the problems of serial programming required by a digital computer and also the time and amplitude scaling usually needed for analog operation. It uses a centralized fourth order variable step Runga-Kutta routine for all integrations, making the solving of differential equations easy. It was developed to provide a simple method to solve equations on a digital computer. In essence, the language forces a digital computer to act as, or mimic, an analog computer. MIMIC can best be described as a digital-analog (or continuous system) simulator.

One of MIMIC's more attractive features is its parallelism, which it gets from its analog nature. The programming statements need not be in any particular order. In this, it differs from such conventional digital languages as FORTRAN which relay on the order in which statements execute. This allows MIMIC programmers to more closely match the simulations to the real world problems of interest.

MIMIC uses a fixed format for its statements. The result always begins in column 10, and expressions begin in column 19. Columns 2-7 are reserved for logical variables which control which statements to execute. The FORTRAN terms integer and real number have no meaning in MIMIC; all numbers contain decimal points. Variable names can be one to six alpha numeric characters, and unlike FORTRAN may begin with a number. The term "10." represents the number ten, while "10" would be interpreted as a variable.

The language uses arithmatic operators and a set of functions to perform its tasks. MIMIC uses the same operators as FORTRAN, +, -, *, and / for addition, subtraction, multiplication, and division. Note, however, that the exponential operator "**" does not exist in MIMIC. Functions are specified by three letter mnemonic codes (e.g., "SQR" for SQUARE ROOT, "INT" for INTEGRAL). Combining these in proper forms allows the user to program and solve any problem.

As a time simulation language, MIMIC allows only one independent variable, time, which increments automatically. All variables change with time as expected from an analog simulator, and this makes integration fast and simple.

MIMIC accepts data only at the beginning of the program. The FORTRAN read statement has no counterpart in MIMIC. Thus, MIMIC cannot be run interactively, all jobs run in "BATCH" mode.

The user can initialize as many variables as desired, but all should vary with time in course of execution. MIMIC accepts constant terms which have the same value at the start of each run, parameter terms which change value for each run, and arbitrary functions of one or two variables which can be constant or parameter. Data has a fixed format.

A MIMIC program gives output, in fixed format, at specified intervals of the independent variable, time. Any variable in the program is available for output, as well as any arithmatic expression.

MIMIC also has the capability of generating up to 10 plots per run of as many as five variables against any other variable, including time. The MIMIC processor selects the scales and labels the plots.

MIMIC's most useful feature is its centralized integration function. It eliminates the burden of building, coding, and debugging an integration scheme, which may or may not give accurate results. MIMIC will take the time integral, or derivative, of any variable in the program. Systems of differential equations lend themselves well to this programming tool.

It takes very little time to become proficient with MIMIC. Reference 7 gives a complete description of the language. It explores, in-depth, MIMIC's workings, and describes each of the functions available to the programmer. This powerful tool provides a complete time history simulation of any physical phenomenon quickly and easily.

APPENDIX B - EXAMPLE PROBLEM

This appendix contains a complete sample run of the program ENGOUT. The program itself is listed, as is all the input data and the output generated by the program.

The example is run for a theoretical aircraft with one pair of main gear bogies. It is powered by four engines. The spindown time constant of a failed engine is one-half second. The run begins at zero forward speed, and full thrust is entered as a step function at time zero. The aircraft is equipped with a yaw damper which enters rudder as a function of yaw rate. The damper has a maximum authority of four degrees. The runway is dry and hard, as reflected by the Runway Condition Reading (RCR) of 23. The simulated pilot has a reaction time of one second, afterwhich he commands the full rudder deflection available for his instantaneous speed. The aircraft accelerates to a speed of 140 knots true airspeed, at which a failure of the outer right engine occurs. The center of gravity, for the 319,700 pound gross weight, is 5% of the mean aerodynamic chord forward of the reference, as reflected by the parameter CG. There is no crosswind.

The input data appears as it actually would on a printout. It is not inputted in this fashion, but in the MIMIC format as described in Appendix A.

Prior to failure, output is printed every second as specified by the parameter DT1. The output shown describes the aircraft accelerating with essentially no deviation from the runway centerline. The variable TRIM remains equal to one until an engine failure occurs, at which time it is set equal to zero, 36.43 seconds after starting.

After failure, output is printed every 0.2 seconds, as specified by the input parameter DT2. This allows closer tracking of parameters of interest. For a full second after failure, the pilot does not enter directional control, and the failure induced yaw motion is opposed only by the aircraft directional aerodynamics and the yaw damper. The damper enters its full authority to combat the yaw rate induced by the engine failure. After one second, the pilot commands the full actuator output to enter full rudder control. The rudder input, as well as nose wheel steering commanded by the pilot thru the rudder pedals, causes a yaw rate which allows the pilot to regain control of the aircraft, and eventually realigns the aircraft with the runway centerline 6 seconds after the failure occurred. The aircraft has deviated 13.7 feet from the centerline. The last action of the program is to print the final values of all the variables in the program.

This example illustrates the use of ENGOUT. It is of interest that the failure-control process takes only 6 seconds. This rapidly occurring process is easily affected by a small change in almost any of the input parameters.

*** MIMIC SOURCE PROGRAM ***

```
$LIST
C        FOR MIKE MIEDLAR  ASD/ENFTC  53433
C
C**************************************************
C**********  INPUT VARIABLE DICTIONARY   **********
C**************************************************
C
C  ALPHAD     ANGLE OF ATTACK OF THE FUSELAGE REFERENCE LINE
C  B          WING REFFRENCE SPAN
C  BLCG       BUTT LINE OF THE CENTER OF GRAVITY
C  BLIL       BUTT LINE OF THE INNER LEFT ENGINE
C  BLIR       BUTT LINE OF THE INNER RIGHT ENGINE
C  BLMAL      BUTT LINE OF THE MAIN AFT LEFT LANDING GEAR STRUT
C  BLMAR      BUTT LINE OF THE MAIN AFT RIGHT LANDING GEAR STRUT
C  BLMFL      BUTT LINE OF THE MAIN FORWARD LEFT LANDING GEAR STRUT
C  BLMFR      BUTT LINE OF THE MAIN FORWARD RIGHT LANDING GEAR STRUT
C  BLN        BUTT LINE OF THE NOSE LANDING GEAR STRUT
C  BLOL       BUTT LINE OF THE OUTER LEFT ENGINE
C  BLOR       BUTT LINE OF THE OUTER RIGHT ENGINE
C  BMAG       EQUIVALENT MAIN AFT GEAR DAMPING COEFFICIENT
C  BMFG       EQUIVALENT MAIN FORWARD GEAR DAMPING COEFFICIENT
C  C          MEAN AERODYNAMIC CHORD
C  CD         DRAG COEFFICIENT
C  CG         X POSITION OF CENTER OF GRAVITY IN %CHORD FROM REFERENCE
C                EXAMPLE: ENTER 5. FOR CG AT 30% AND REFERENCE AT 25%
C  CLB        CHANGE IN ROLLING MOMENT COEFFICIENT WITH  SIDESLIP ANGLE
C  CLDR       CHANGE IN ROLLING MOMENT COEFFICIENT WITH RUDDER DEFLECTION
C  CLDW       CHANGE IN ROLLING MOMENT COEFFICIENT WITH WHEEL DEFLECTION
C  CLIFT      LIFT COEFFICIENT
C  CLP        CHANGE IN ROLLING MOMENT COEFFICIENT WITH ROLL RATE
C  CLR        CHANGE IN ROLLING MOMENT COEFFICIENT WITH YAW RATE
C  CMDERF     CHANGE IN PITCHING MOMENT COEFFICIENT WITH ELEVATOR, WITH
C                CG AT REFERENCE POSITION
C  CMGEAR     EFFECT ON PITCHING MOMENT COEFFICIENT OF LANDING GEARS
C  CMGREF     EFFECT ON PITCHING MOMENT COEFFICIENT OF GROUND EFFECT
C  CMRF       PITCHING MOMENT COEFFICIENT WITH CG AT REFERENCE (BASIC CM)
C  CMSRF      CHANGE IN PITCHING MOMENT COEFFICIENT WITH HORIZONTAL STABI
C                WITH CG AT REFERENCE POSITION
C  CNBRF      CHANGE IN YAWING MOMENT COEFFICIENT WITH SIDESLIP, WITH CG
C                AT REFERENCE POSITION
C  CNDRRF     CHANGE IN YAWING MOMENT COEFFICIENT WITH RUDDER DEFLECTION,
C                CG AT REFERENCE POSITION
C  CNDW       CHANGE IN YAWING MOMENT COEFFICIENT WITH WHEEL DEFLECTION
C  CNR        CHANGE IN YAWING MOMENT COEFFICIENT WITH YAW RATE
C  CONTIL     THESE FOUR VARIABLES CONTROL THE THRUST OF EACH ENGINE.
C  CONTIR     ENTER "-1." IF THE ENGINE IS IN GOOD WORKING ORDER
C  CONTOL     ENTER "0." IF YOUR AIRCRAFT DOES NOT HAVE THAT ENGINE.
C  CONTOR     ENTER "1." IF THE ENGINE FAILS.
C  CYB        CHANGE IN SIDE FORCE COEFFICIENT WITH SIDESLIP
C  CYDR       CHANGE IN SIDE FORCE COEFFICIENT WITH RUDDER DEFLECTION
C  CYDW       CHANGE IN SIDE FORCE COEFFICIENT WITH WHEEL DEEFLECTION
C  CYR        CHANGE IN SIDE FORCE COEFFICIENT WITH YAW RATE
C  DETOD      ELEVATOR DEFLECTION FOR TAKE OFF
C  DNWSHD     DOWNWASH ANGLE ON HORIZONTAL STABILZER, NEGATIVE DOWN
C  DRMD       MAXIMUM RUDDER DEFLECTION
C  DRRTMD     RATE OF FULL ACTUATOR RUDDER INPUT
C  DRYDMD     MAXIMUM YAW DAMPER RUDDER INPUT
C  DT1        INTERVAL BETWEEN PRINTOUTS, BEFORE FAILURE
C  DT2        INTERVAL BETWEEN PRINTOUTS, AFTER FAILURE
C  DWMD       MAXIMUM WHEEL DEFLECTION
C  FSCGRF     REFERENCE FUSELAGE STATION OF THE CENTER OF GRAVITY
```

```
C  FSHT      FUSELAGE STATION OF THE QUARTER CHORD OF THE HORIZONTAL STA
C  FSIL      FUSELAGE STATION OF THE INNER LEFT ENGINE
C  FSIR      FUSELAGE STATION OF THE INNER RIGHT ENGINE
C  FSMAL     FUSELAGE STATION OF THE MAIN AFT LEFT LANDING GEAR STRUT
C  FSMAR     FUSELAGE STATION OF THR MAIN AFT RIGHT LANDING GEAR STRUT
C  FSMFL     FUSELAGE STATION OF THE MAIN FORWARD LEFT LANDING GEAR STRU
C  FSMFR     FUSELAGE STATION OF THE MAIN FORWARD RIGHT LANDING GEAR STR
C  FSN       FUSELAGE STATION OF THE NOSE LANDING GEAR STRUT
C  FSOL      FUSELAGE STATION OF THE OUTER LEFT ENGINE
C  FSOR      FUSELAGE STATION OF THE OUTER RIGHT ENGINE
C  FSVT      FUSELAGE STATION OF THE QUARTER CHORD OF THE VERTICAL TAIL
C  G         GRAVITATIONAL CONSTANT
C   YOU DETERMINE ALL PILOT CONTROL GAINS THRU TRIAL AND ERROR.  START W
C   AN INITIAL VALUE FOR EACH OF "1.". AND IF THE SIMULATED PILOT TRIMS
C   AIRCRAFT IN THE HIGHEST CROSSWIND OF INTEREST, THE GAINS ARE OK.  IF
C   INCREASE THE GAINS AND TRY AGAIN.  "1." SHOULD BE VERY CLOSE.  DON'
C   OVERLY DEMANDING.  IF IN A HIGH CROSSWIND THE "PILOT" HOLDS IT WITHI
C   FOOT OR TWO OF THE CENTERLINE, THAT IS GOOD ENOUGH.
C  GAINNT    PILOT GAIN TO TRIM NOSE WHEEL BEFORE FAILURE
C  GAINRT    PILOT GAIN TO TRIM RUDDER BEFORE FAILURE
C  GAINWP    PILOT GAIN ON BANK ANGLE TO TRIM WHEEL
C  GAINWP    PILOT GAIN ON ROLL RATE TO TRIM WHEEL
C  GAINYS    GAIN ON SIDESLIP FOR YAW DAMPER
C  GAINYP    GAIN ON ROLL RATE FOR YAW DAMPER
C  GAINYR    GAIN ON YAW RATE FOR YAW DAMPER
C  IED       INCIDENCE OF ENGINES TO FUSELAGE REFERENCE LINE
C  IXX       X-MOMENT OF INERTIA
C              IF SET =0, ROLL ANGLE AND RATE HELD AT ZERO
C  IZZ       Z-MOMENT OF INERTIA
C  KMAG      EQUIVALENT SPRING FORCE COEFFICIENT OF MAIN AFT GEAR
C  KMFG      EQUIVALENT SPRING FORCE COEFFICIENT OF MAIN FORWARD GEAR
C  LCVFY     CONTROL VARIABLE ON NOSE GEAR
C              ENTER 0. IF CASTORED, ENTER 1. IF NOT
C  MUROLL    ROLLING COEFFICIENT OF FRICTION
C  NMD       MAXIMUM NOSE-STEERING ANGLE
C  NSTRTD    RATE OF FULL NOSE STEERING INPUT
C  PRT       PILOT REACTION TIME BETWEEN FAILURE AND CONTROL INPUT
C  QO        FREE STREAM DYNAMIC PRESSURE
C  RCR       RUNWAY CONDITION READING (23. FOR DRY, 9. FOR ICY)
C  RDNS      CONTROL VARIABLE ON RUDDER-NOSE-WHEEL SYSTEM
C              ENTER 1. IF BOTH ARE CONTROLLED THRU RUDDER PEDALS
C              ENTER 0. IF NOT
C  RHO       AMBIENT AIR DENSITY
C  RHOO      SEA LEVEL AIR DENSITY
C  S         WING PLANFORM AREA
C  STBTOD    TAKE OFF HORIZONTAL STABILIZER SETTING
C  TAU       SPIN DOWN TIME CONSTANT FOR FAILED ENGINE
C  THR       THRUST OF EACH NON-FAILED ENGINE
C  THRAMP    TIME TO RAMP IN THRUST FROM ZERO TO FULL
C              ENTERING ZERO STEPS THRUST IN FULL AT T=0.
C              (FOR STARTING AT ZERO SPEED)
C  TXW       TIME TO RAMP IN CROSSWIND, FROM ZERO KNOTS
C  VKEAS     EQUIVALENT AIR SPEED, IN KNOTS
C  VKFAIL    SPEED AT WHICH FAILURE OCCURS, IN KNOTS
C  VKROT     ROTATION SPEED, IN KNOTS
C  VKST      SPEED YOU WANT PROGRAM TO START AT, IN KNOTS
C  VKSTXW    AIRCRAFT SPEED AT WHICH CROSSWIND STARTS
C  VKXW      MAXIMUM SPEED OF CROSSWIND, IN KNOTS, POSITIVE FROM RIGHT
C  WLCG      WATER LINE OF THE CENTER OF GRAVITY
C  WLGR      WATER LINE OF THE GROUND LINE
C  WLIL      WATER LINE OF THE INNER LEFT ENGINE
C  WLIR      WATER LINE OF THE INNER RIGHT ENGINE
C  WLOL      WATER LINE OF THE OUTER LEFT ENGINE
C  WLOR      WATER LINE OF THE OUTER RIGHT ENGINE
C  WWD       WINDMILLING DRAG OF THE FAILED ENGINE, NEGATIVE PACK
C  WT        GROSS WEIGHT
```

```
C
C***********************************************
C**********  OUTPUT VARIABLE DICTIONARY  **********
C***********************************************
C
C  BETADG     SIDESLIP ANGLE
C  DRDEG      TOTAL RUDDER DEFLECTION
C  DRRCTD     PILOT RUDDER DEFLECTION AFTER FAILURE
C  DRTRMD     PILOT RUDDER DEFLECTION BEFORE FAILURE
C  DRYDDG     YAW DAMPER RUDDER DEFLECTION
C  DWDEG      PILOT WHEEL DEFLECTION
C  FXAERO     AERODYNAMIC X FORCE  (THRUST MINUS DRAG)
C  FXFRIC     TOTAL ROLLING FRICTION FORCE
C  FXMAL      ROLLING FRICTION FORCE ON MAIN AFT LEFT GEAR TIRES
C  FXMAR      ROLLING FRICTION FORCE ON MAIN AFT RIGHT GEAR TIRES
C  FXMFL      ROLLING FRICTION FORCE ON MAIN FORWARD LEFT GEAR TIRES
C  FXMFR      ROLLING FRICTION FORCE ON MAIN FORWARD RIGHT GEAR TIRES
C  FXN        ROLLING FRICTION FORCE ON NOSE GEAR TIRES
C  FYAERO     AERODYNAMIC Y FORCE   (SIDE FORCE)
C  FYFRIC     TOTAL SIDE FRICTION FORCE
C  FYMA       SIDE FRICTION FORCE ON MAIN AFT GEAR TIRES
C  FYMF       SIDE FRICTION FORCE ON MAIN FORWARD GEAR TIRES
C  FYN        SIDE FRICTION FORCE ON NOSE GEAR TIRES
C  FZAERO     AERODYNAMIC Z FORCE   (WEIGHT MINUS LIFT)
C  FZMAL      NORMAL REACTION ON MAIN AFT LEFT GEAR
C  FZMAR      NORMAL REACTION ON MAIN AFT RIGHT GEAR
C  FZMFL      NORMAL REACTION ON MAIN FORWARD LEFT GEAR
C  FZMFR      NORMAL REACTION ON MAIN FORWARD RIGHT GEAR
C  FZN        NORMAL REACTION ON NOSE GEAR
C  MASKI      LOGICAL VARIABLE DETERMINING IF MAIN AFT GEAR TIRES SKID
C                 =0 IF NO, =1 IF YES
C  MFSKI      LOGICAL VARIABLE DETERMINING IF MAIN FORWARD GEAR TIRES SKI
C                 =0 IF NO, =1 IF YES
C  MUMASC     MAIN AFT GEAR STATIC FRICTION COEFFICIENT
C  MUMASK     MAIN AFT GEAR KINETIC FRICTION COEFFICIENT
C  MUMFSC     MAIN FORWARD GEAR STATIC FRICTION COEFFICIENT
C  MUMFSK     MAIN FORWARD GEAR KINETIC FRICTION COEFFICIENT
C  MUNSC      NOSE GEAR STATIC FRICTION COEFFICIENT
C  MUNSK      NOSE GEAR KINETIC FRICTION COEFFICIENT
C  MUR        ROLLING FRICTION COEFFICIENT
C  NSKI       LOGICAL VARIABLE DETERMINING IF NOSE GEAR TIRES SKID
C                 =0 IF NO, =1 IF YES
C  NSPLTD     PILOT NOSE STEERING INPUT AFTER FAILURE
C  NSTDEG     TOTAL NOSE STEERING INPUT
C  NSTRMD     PILOT NOSE STEERING INPUT BEFORE FAILURE
C  PDDEG      ROLL ACCELERATION
C  PDEG       ROLL RATE
C  PHIDEG     ROLL ANGLE
C  PSIDEG     YAW ANGLE
C  QO         FREE STREAM DYNAMIC PRESSURE
C  RDDEG      YAW ACCELERATION
C  RDEG       YAW RATE
C  REACT      LOGICAL VARIABLE DETERMINING IF PILOT HAS REACTED TO FAILUR
C                 =0 IF NO, =1 IF YES
C  SKID       LOGICAL VARIABLE DETERMINING IF ALL TIRES SKID
C                 =0 IF NO, =1 IF YES
C  T          TIME
C  TFAIL      TIME AT WHICH ENGINE FAILS
C  THRIL      THRUST OF INNER LEFT ENGINE
C  THRIR      THRUST OF INNER RIGHT ENGINE
C  THROL      THRUST OF OUTER LEFT ENGINE
C  THROR      THRUST OF OUTER RIGHT ENGINE
C  THRO       THRUST OF FAILED ENGINE(S) AT TIME OF FAILURE
C  TRIM       LOGICAL VARIABLE DETERMINING IF FAILURE HAS OCCURED
C                 =0 IF YES, =1 IF NO
C  U          GROUND SPEED (FT/SEC) IN X BODY DIRECTION
```

```
C  UD          LINEAR ACCELERATION (FT/SEC/SEC) IN X BODY DIRECTION
C  UTOT        AIR SPEED (FT/SEC) IN X BODY DIRECTION
C  V           GROUND SPEED (FT/SEC) IN Y BODY DIRECTION
C  VD          LINEAR ACCELERATION (FT/SEC/SEC) IN Y BODY DIRECTION
C  VKEAS       EQUIVALENT AIR SPEED (KNOTS)
C  VKTAS       TRUE AIR SPEED (KNOTS)
C  VKTGS       TRUE GROUND SPEED (KNOTS)
C  VTOT        AIR SPEED (FT/SEC) IN Y BODY DIRECTION
C  WMD         MAXIMUM WIND MILLING DRAG
C  X           TRANSLATION IN RUNWAY X DIRECTION
C  XD          ACCELERATION IN RUNWAY X DIRECTION
C  Y           TRANSLATION IN Y RUNWAY DIRECTION
C  YAWMAD      MAIN AFT GEAR TIRE YAW ANGLE
C  YAWMFD      MAIN FORWARD GEAR TIRE YAW ANGLE
C  YAWNTD      NOSE GEAR TIRE YAW ANGLE
C  YD          ACCELERATION IN RUNWAY Y DIRECTION
C
C
      CON(C,B,S,ALPHAD,IED)
      CON(WT,IXX,IZZ,WLCG,BLCG,CG)
      CON(WLGP,FSVT,FSHT,FSCREF)
      CON(RHOO,RHO,G)
      CON(TAU,THRAMP)
      CON(BLOL,WLOL,FSOL,CONTOL)
      CON(BLIL,WLIL,FSIL,CONTIL)
      CON(BLIR,WLIR,FSIR,CONTIR)
      CON(BLOR,WLOR,FSOR,CONTOR)
      CON(BLN,FSN)
      CON(BLMFR,FSMFR)
      CON(BLMFL,FSMFL)
      CON(BLMAR,FSMAR)
      CON(BLMAL,FSMAL)
      CON(KMFG,BMFG)
      CON(KMAG,BMAG)
      CON(CLR,CLDW,CLF,CLP,CLDR)
      CON(CNBRF,CNR,CNDRRF,CNDW)
      CON(CYB,CYP,CYDR,CYDW)
      CON(CMRF,CMGEAR,CMGREF)
      CON(CMDERF,DETOD,CMSRF,STBTCD,DNWSHD)
      CON(PRT,GAINRT,DRRTMD)
      CON(DRYDMD,GAINYB,GAINYR,GAINYP,CONYD)
      CON(DWMD,GAINWP,GAINWB)
      CON(NMD,NSTRTD,GAINNT,PONS)
      CON(LCVFY,MUROLL,RCR,CLIFT,CD,VKRCT)
      CON(DT1,DT2)
C
C
      WMD1    CFN(4.)
      THR1    CFN(4.)
      DRM1    CFN(6.)
              PAR(VKST,VKFAIL,VKXW,TXW,VKSTXW)
C
C
      WMD     FUN(WMD1,VKEAS)
      THR     FUN(THR1,VKEAS)
      DRMD    FUN(DRM1,VKEAS)
C
C
C   THESE EQUATIONS CHANGE DEGREE MEASURES TO RADIAN MEASURES.
      STAB    (ALPHAD+STBTOD+DNWSHD)/57.3
      IENG    (ALPHAD+IED)/57.3
      DE      DETOD/57.3
      NSTRT   NSTRTD/57.3
      DRRTM   DRRTMD/57.3
      DWM     DWMD/57.3
      NM      NMD/57.3
```

```
C
C     THESE ARE LCV'S TO BE USED IN DETERMINING FLIGHT CONDITION.
          TRIP      FSW(VKTGS-VKFAIL,1.,1.,0.)
          REACT     FSW(T-(TFAIL+PRT),0.,1.,1.)
          LCVFYN    LSW(LCVFY,1.,0.)
          LCVRN     LSW(RDNS,1.,0.)
          LCVMF     LSW(FSMFR,1.,0.)
          LCVFL     ABS(IOR(OLFAIL,ILFAIL,IFFAIL,ORFAIL))
          LCVNG     LSW(FSMFR,0.,1.)
          NWIND     FSW(VKTGS-VKSTXW,1.,1.,0.)
          NSK       FSW(ABS(FYNA)-(MUMAX*FZNA+1.)*LCVFYN,0.,1.,1.)
          MASK      FSW(ABS(FYMAA)-MUMAX*FZMA-1.,0.,1.,1.)
          NNSK      NOT(NSK)
          NMASK     NOT(MASK)
          NSK1      FSW(ABS(FYNB)-(MUMAX*FZNA+1.)*LCVFYN,0.,1.,1.)
          NNSK1     NOT(NSK1)
          MASK1     FSW(ABS(FYMAB)-MUMAX*FZMA-1.,0.,1.,1.)
          NMASK1    NOT(MASK1)
          MFSK      FSW(ABS(FYMFA)-MUMAX*FZMF+LCVMF,0.,1.,1.)
          NMFSK     NOT(MFSK)
          MFSK1     FSW(ABS(FYMFB)-MUMAX*FZMF+LCVMF,0.,1.,1.)
          NMFSK1    NOT(MFSK1)
          SKID      LSW(AND(NSK1,MASK1,MFSK1),1.,0.)
          RCLL      LSW(IXX,1.,0.)
          NROLL     NOT(ROLL)
C
C     THESE ARE THE LINEAR DISPLACEMENTS.
C     X IS THE DISTANCE DOWN THE RUNWAY.
C     Y IS THE DISTANCE ACROSS THE RUNWAY.
          XD        U*COS(PSI)-V*SIN(PSI)
          X         INT(XD,0.)
C
          YD        U*SIN(PSI)+V*COS(PSI)
          Y         INT(YD,0.)
C
C     CROSSWIND IS ENTERED HERE. IT IS RAMPED IN FROM ZERO TO
C     VKXW OVER TXW, OR IS STEPPED IN IF TXW EQUALS ZERO.
 NWIND    TWIND     T
          FAC       FSW(TXW,1.,1.,(T-TWIND)/TDIFF)
          TDIFF     LSW(TXW,TXW,1.)
          RAMP      LIM(FAC,0.,1.)
          VXW       RAMP*1.689*VKXW
          UTOT      U+VXW*SIN(PSI)
          VTOT      V+VXW*COS(PSI)
C
C     THESE ARE THE LINEAR VELOCITIES, IN THE BODY AXIS SYSTEM.
          UD        (FXAERO-FXFRIC)/M
          U         INT(UD,VKST*1.689)
C
          VD        (FYAERO+FYFRIC)/M
          V         INT(VD,0.)
C
C     VKTGS IS THE GROUND SPEED, IN KNOTS.
C     VKTAS AND VKEAS ARE TRUE AND EQUIVALENT AIRSPEEDS, IN KNOTS.
C     VKLO IS THE SPEED AT WHICH LIFT EQUALS WEIGHT, IN KNOTS.
          VTAS      SQR(UTOT*UTOT+VTOT*VTOT)
          VKTAS     VTAS/1.689
          VTGS      SQR(U*U+V*V)
          VKTGS     VTGS/1.689
          VKEAS     SQR(RHO/RHOO)*VKTAS
          VKLO      SQR(WT/(CLIFT*.5*RHO*S))
C
C     THESE ARE VARIOUS PHYSICAL PROPERTIES.
          QO        .5*RHO*VTAS*VTAS
          M         WT/G
          FSCG      FSCGRF+C*(CG/100.)
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          THRUST    THRCL+THRIL+THRIR+THROR
          LIFT      CLIFT*GQ*S*COS(PHI)
          DRAG      CD*QQ*S
          FZM       FZMA+FZMF
C
C     THIS SECTION DETERMINES WHICH, IF ANY, ENGINES FAIL.
          THROL     FSW(CONTOL,THR*TFAC,0.,THRF)
          THRIL     FSW(CONTIL,THR*TFAC,0.,THRF)
          THRIR     FSW(CONTIR,THR*TFAC,0.,THRF)
          THROR     FSW(CONTOR,THR*TFAC,0.,THRF)
          TFAC1     FSW(THRAMP,1.,1.,T/MAX(THRAMP,1.))
 TRIM     TFAC      LSW(VKST,1.,LIM(TFAC1,0.,1.))
          OLFAIL    FSW(CONTOL,0.,0.,1.)
          ILFAIL    FSW(CONTIL,0.,0.,1.)
          IRFAIL    FSW(CONTIR,0.,0.,1.)
          ORFAIL    FSW(CONTOR,0.,0.,1.)
          VKSTOP    LSW(LCVFL,VKLO,VKROT)
C
C     THRF IS THE THRUST OF THE FAILED ENGINE.
 TRIM     THR0      THR*TFAC
 TRIM     TFAIL     T
          FAIL      T-TFAIL
          NTAU      NOT(TAU)
 TAU      THRF      THR0*EXP(-FAIL/TAU)+WMO*(1.-EXP(-FAIL/TAU))
 NTAU     THRF      0.
C     THESE DIMENSIONS ARE NECESSARY TO DETERMINE LOADING CONDITION.
          A1        FSOL-FSN
          A2        FSIL-FSN
          A3        FSMAR-FSOL
          A4        FSMAR-FSIL
          A5        FSOG-FSN
          A6        FSMAR-FSOG
          A7        WLOG-WLGR
          A8        L1*L1*L1
          A9        L1*L1
          A10       L2*L2*L2
          A11       L2*L2
          A12       WLOR-WLGR
          A13       WLIR-WLGR
          L1        FSW(FSMFR,0.,FSMAR-FSN,FSMFR-FSN)
          L2        FSW(FSMFR,0.,FSMAR-FSN,FSMAR-FSMFR)
C
C     Y-THRUST TERMS, EXCEPT FOR DIRECTLY ABOVE EITHER MAIN GEAR.
          P1F       FSW(FSOL-FSMFR,(THROL+THROR)*SIN(IENG),0.,0.)
          C1        P1F*A1/L1*(A9-A1*A1)
          P2F       FSW(FSIL-FSMFR,(THRIL+THRIR)*SIN(IENG),0.,0.)
          C2        P2F*A2/L1*(A9-A2*A2)
          P1A       FSW(FSOR-FSMFR,0.,0.,(THROR+THROL)*SIN(IENG))
          E1        P1A*A3/L2*(A11-A3*A3)
          D11       FSW(FSOR-FSMAR,E1,0.,0.)
          M1        FSW(FSOP-FSMAR,0.,0.,P1A*(FSOP-FSMAR))
          D12       M1*L2
          D1        D11+D12
          P2A       FSW(FSIR-FSMFR,0.,0.,(THRIR+THRIL)*SIN(IENG))
          E2        P2A*A4/L2*(A11-A4*A4)
          D21       FSW(FSIR-FSMAR,E2,0.,0.)
          M2        FSW(FSIR-FSMAR,0.,0.,P2A*(FSIR-FSMAR))
          D22       M2*L2
          D2        D21+D22
C
C     X-THRUST TERMS, EXCEPT FOR DIRECTLY ABOVE MAIN FORWARD GEAR.
          P3F       FSW(FSOL-FSMFR,(THRCL+THROF)*COS(IENG),0.,0.)
          C3        P3F*A12/A9*(A8-3.*A1*A1*L1+4.*A1*A1*A1)
          P4F       FSW(FSIL-FSMFR,(THRIL+THRIR)*COS(IENG),0.,0.)
          C4        P4F*A13/A9*(A8-3.*A2*A2*L1+4.*A2*A2*A2)
          P3A       FSW(FSOL-FSMFR,0.,0.,(THROP+THROL)*COS(IENG))
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      E3        P3A*A12/A11*(A10-3.*A3*A3*L2*4.*A3*A3*A3)
      D31       FSW(FSOL-FSMAL,F3,0.,0.)
      M3        FSW(FSOL-FSMAL,0.,P3A*A12,P3A*A12)
      D32       M3*L2
      D3        D31+D32
      P4A       FSW(FSIL-FSMFR,0.,0.,(THRIR+THRIL)*COS(IENG))
      E4        P4A*A13/A11*(A10-3.*A4*A4*L2*4.*A4*A4*A4)
      D41       FSW(FSIL-FSMAR,L4,0.,0.)
      M4        FSW(FSIL-FSMAR,0.,P4A*A13,P4A*A13)
      D42       M4*L2
      D4        D41+D42
C
C     C.G. TERMS, EXCEPT FOR DIRECTLY ABOVE MAIN FORWARD GEAR.
      P5F       FSW(FSCG-FSMFR,LIFT-WT,0.,0.)
      C5        P5F*A5/L1*(A9-A5*A5)
      P6F       FSW(FSCG-FSMFR,CM*L*GD*C*M*UD*A7+CD*GD*S*A7,0.,0.)
      C6        P6F/A9*(A8-3.*A5*A5*L2*4.*A5*A5*A5)
      P5A       FSW(FSCG-FSMAR,0.,0.,LIFT-WT)
      D5        P5A*A6/L2*(A11-A6*A6)
      P6A       FSW(FSCG-FSMAR,0.,0.,CM*GD*S*C*M*UD*A7+CD*GD*S*A7)
      D6        P6A/A11*(A10-3.*A6*A6*L2*4.*A6*A6*A6)
C
C     Y-THRUST DIRECTLY ABOVE MAIN AFT GEAR.
      RMA1      FSW(FSIR-FSMAR,0.,(THRIL+THRIR)*SIN(IENG),0.)
      RMA2      FSW(FSOR-FSMAR,0.,(THROL+THROR)*SIN(IENG),0.)
C
C     CG&T DIRECTLY ABOVE MAIN FORWARD GEAR
      RMF1      FSW(FSOR-FSMFR,0.,(THROL+THROR)*SIN(IENG),0.)
      RMF2      FSW(FSIR-FSMFR,0.,(THRIL+THRIR)*SIN(IENG),0.)
      RMF3      FSW(FS  -FSMFR,0.,LIFT-WT,0.)
      P7F       FSW(FSL  FSMFR,0.,(THROL+THROR)*COS(IENG),0.)
      C7        P7F*A12/A9*(A8-3.*A8*4.*A8)
      P7A       P7F
      D7        P7A*A12/A11*(A10-3.*A10*4.*A10)
      P8F       FSW(FSIR-FSMFR,0.,(THRIL+THRIR)*COS(IENG),0.)
      C8        P8F*A13/A9*(A8-3.*A8*4.*A8)
      P8A       P8F
      D8        P8A*A13/A11*(A10-3.*A10*4.*A10)
      P9F       FSW(FSCG-FSMFR,0.,CM*GD*S*C*M*UD*A7+CD*GD*S*A7,0.)
      C9        P9F/A9*(A8-3.*A8*4.*A8)
      P9A       P9F
      D9        P9A/A11*(A10-3.*A10*4.*A10)
C
C     TOTAL AERODYNAMIC FORCES IN X, Y, & Z DIRECTIONS
      FXAERO    THRUST*COS(IENG)-DRAG
      FYAER1    CY*GD*S+CLIFT*GD*S*SIN(PHI)-(M*U*R)
      FYAERO    FYAER1+(M*U*F)*SKID
      FZAERO    LT-LIFT-(THROL+THRIL+THRIR+THROR)*SIN(IENG)
C
C     TOTAL FRICTION FORCES IN X & Y DIRECTIONS
      FXFRIC    MUS*FZAERO
      FYFRIC    FYN+FYMF+FYMA
C
C     USE OF Z MOMENT EQUATION TO OBTAIN MOMENT AT MF GEAR
      MTHRO     (THROF+THROL)*COS(IENG)*A12
      MTHRI     (THRIR+THRIL)*COS(IENG)*A13
      MMAC1     FSW(FSOL-FSMAL,0.,MTHRO+MTHRIY)
      MTHROY    (THROF+THROL)*SIN(IENG)*(FSOL-FSMAL)
      MMAC2     FSW(FSIL-FSMAL,0.,MTHRI+MTHRI+MTHRIY)
      MTHRIY    (THRIR+THRIL)*SIN(IENG)*(FSIL-FSMAL)
      MMAC      MMAC1+MMAC2
      SUM1      -D1-D2+D3+D4-D5-D6+D7+D8-D9
      SUM2      -D1-D2+D3+D4-D5-D6+D7+D8-D9
      LEN       FSW(FSMFR,0.,L2,L2+L1)
      MMFG1     (SUM1+SUM2-MMAC*L2)/(2.*LEN)
      MMFG      FSW(FSMFR,0.,0.,MMFG1)
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C
C     NOSE GEAR TIRE FORCE WITH MAIN GEAR PRESENT
 LCVMF    TYOM1     P1F*(FSMFR-FSOR)
 LCVMF    TYIM1     P2F*(FSMFR-FSIR)
 LCVMF    TXOM1     (P3F+P7F)*(WLGR-WLOL)
 LCVMF    TXIM1     (P4F+P8F)*(WLGR-WLIL)
 LCVMF    LWM1      P5F*(FSMFR-FSCG)
 LCVMF    MCG1      P6F+P9F
 LCVMF    FZNC      -(-MMFG*TYOM1+TYIM1+TXOM1+TXIM1+LWM1+MCG1)/L1
C
C     NOSE GEARTIRE FORCE WITHOUT MF GEAR PRESENT
C     MAIN FORWARD GEAR FORCE, IF GEAR IS PRESENT
          TYOM2     P1F*(FSMAR-FSOR)+D11*L2/(A11-A3*A3)
          TYIM2     P2F*(FSMAR-FSIR)+D21*L2/(A11-A4*A4)
          DEN1      (A10-3.*A3*A3*L2+4.*A3*A3*A3)
          DEN2      (A10-3.*A4*A4*L2+4.*A4*A4*A4)
          TXOM2     P3F*(WLGR-WLOL)-D31*A11/DEN1
          TXIM2     P4F*(WLGR-WLIL)-D41*A11/DEN2
          LWM2      P5F*(FSMAR-FSCG)+P5A*(FSMAR-FSCG)
          MCG2      P6F+P6A+P7F*(WLGR-WLOL)+P8F*(WLGR-WLIL)+P9F
          FZMF1     -(TYOM2+TYIM2+TXIM2+TXOM2+LWM2+MCG2+MMAG)/L2
 LCVMF    FZMF      FZMF1+RMF1+RMF2+RMF3-FZN*(L1+L2)/L2
 LCVNG    FZNG      FZMF1
          FZN       MAX(FZNC,0.)
 LCVMF    FZMA      FZAERO-FZN-FZMF
 LCVNG    FZMA      FZAERO-FZN
 LCVNG    FZMF      0.
C
C     FORCES ON EACH TIRE OF MAIN FORWARD GEAR
 LCVMF    FZMFR1    (BLCG-BLMFL)/(BLMFR-BLMFL)*FZMF
 LCVMF    FZMFR2    KMFG*(BLMFR-BLCG)*PHI
 LCVMF    FZMFR3    BMFG*(BLMFR-BLCG)*P
 LCVMF    FZMFR     FZMFR1+FZMFR2+FZMFR3
 LCVNG    FZMFR     0.
          FZMFL     FZMF-FZMFR
C
C     FORCES ON EACH TIRE OF MAIN AFT GEAR
          FZMAR1    (BLCG-BLMAL)/(BLMAR-BLMAL)*FZMA
          FZMAR2    KMAG*(BLMAR-BLCG)*PHI
          FZMAR3    BMAG*(BLMAR-BLCG)*P
          FZMAR     FZMAR1+FZMAR2+FZMAR3
          FZMAL     FZMA-FZMAR
C
C     TIRE ROLLING FRICTION FORCES
          MUR1      MIN(FXAERO/FZAERO,MUROLL+.02*MAX(1.-VKTGS,0.))
          MUR       LSW(AND(NOT(T),NOT(VKST)),FXAERO/FZAERO,MUR1)
          FXN       FZN*MUR*COS(NST)+ABS(FYN1*SIN(NST))
          FXMFR     MUR*FZMFR
          FXMFL     MUR*FZMFL
          FXMAR     MUR*FZMAR
          FXMAL     MUR*FZMAL
C
C     TIRE SIDE FORCES
          YAWNT     NST1+NST2+LCVFYN
          YAWMF     (BETAGR+(FSCG-FSMFR)*R/U)*LCVMF
          YAWMA     BETAGR+(FSCG-FSMAR)*R/U
 NSK1     NSKFAC    1.
 NNSK1    NSKFAC    0.
 NSK1     NFYFAC    0.
 NNSK1    NFYFAC    1.
 MASK1    MASKFC    1.
 NMASK1   MASKFC    0.
 MASK1    MAFYFC    0.
 NMASK1   MAFYFC    1.
 MFSK1    MFSKFC    1.
 NMFSK1   MFSKFC    0.
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      MFSK1   MFFYFC   0.
      NMFSK1  MFFYFC   1.
              MUSIDE   LIM(MUMAX-.0053*VKTGS,.044,MUMAX)
              MUMAX    .0392*RCR-.102
              NFAC     LIM(-YAUNTD/8.,-1.,1.)
              MAFAC    LIM(-YAUMAD/8.,-1.,1.)
              MFFAC    LIM(-YAUMFD/8.,-1.,1.)
              MUNSC    NFAC*MUMAX
              MUMASC   MAFAC*MUMAX
              MUMFSC   MFFAC*MUMAX
              MUNSK    NFAC*MUSIDE
              MUMASK   MAFAC*MUSIDE
              MUMFSK   MFFAC*MUSIDE
              FYNA     MUNSC*FZN+FYNOSE
              FYMAA    MUMASC*FZMA+FYMAIN*(FZMA/FZM)
              FYMFA    MUMFSC*FZMF+FYMAIN*(FZMF/FZM)
              FYNOSE   -(FZN/FZAERO)*FYAER1*((90.-NST)/90.)*LCVFYN
              FYMAIN   -FYAER1-FYNOSE
      NSK     FRAC1    -((FZN/FZAERO)*FYAER1*LCVFYN)/(FZMA+FZMF)
      NNSK    FRAC1    0.
      MFSK    FRAC2    -((FZMF/FZAERO)*FYAER1)/((FZN*LCVFYN)+FZMA)
      NMFSK   FRAC2    0.
      MASK    FRAC3    -((FZMA/FZAERO)*FYAER1)/((FZN*LCVFYN)+FZMF)
      NMASK   FRAC3    0.
              FYNB     FYNA+(FRAC2+FRAC3)*(FZN+LCVFYN)
              FYMFB    FYMFA+(FRAC1+FRAC3)*FZMF
              FYMAB    FYMAA+(FRAC1+FRAC2)*FZMA
              FYNSKD   MUNSK*FZN
              FYMASK   MUMASK*FZMA
              FYMFSK   MUMFSK*FZMF
              FYN1     FYNB*NFFYFAC*FYNSKD*NSKFAC
              FYN      FYN1*FZN*MUR*SIN(NST)
              FYMA     FYMAB*MAFYFC*FYMASK*MASKFC
              FYMF     FYMFB*MFFYFC*FYMFSK*MFSKFC
C
C     SIDE SLIP ANGLE
              STOP     FSW(IOR(VTOT,UTOT),0.,1.)
              NSTOP    NOT(STOP)
              STOPG    FSW(IOR(U,V),0.,1.)
              NSTOPG   NOT(STOPG)
      NSTOP   BETA     ATN(VTOT,UTOT)
      NSTOPG  BETAGR   ATN(V,U)
      STOP    BETA     0.
      STOPG   BETAGR   0.
C
C     YAW DAMPER RUDDER CONTROL INPUT
              DRYD1    (1.-TRIM)*CONYD*(GAINYR*R+GAINYB*BETA+GAINYP*P)*57.3
              DRYDDG   LIM(DRYD1,-DRYDMD,DRYDMD)
              DRYD     DRYDDG/57.3
C
C     PILOT RUDDER INPUT
      TRIM    DRTRIM   GAINRT*(Y+YD)
              DRRITE   LSW(IOR(OLFAIL,ILFAIL),-1.,0.)
              DRLEFT   LSW(IOR(ORFAIL,IRFAIL),1.,0.)
              PDRRT    (DRRITE+DRLEFT)*DRRTM
              DRRCT    INT(PDRRT,0.,TRUE,PEACT)
              DRPLT    DRRCT+DRTRIM
C
C     TOTAL RUDDER INPUT
              DRDEG    LIM((DRYD+DRPLT)*57.3,-DRML,DRMD)
              DR       DRDEG/57.3
C
C     PILOT ROLL CONTROL INPUT
      ROLL    DW       LIM((GAINWP*P+GAINWB*PHI),-DWM,DWM)
      NROLL   DW       0.
C
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C    PILOT NOSE STEERING INPUT.
          NST1      NSTTRM*NSTPLT
          NST2      BETAGR*(FSCG-FSN)*R/U
          NST       NST1-NST2*(1.-LCVFYN)
   TRIM   NSTTR1    (GAINNT*YD*(1.-LCVRN)+DR*LCVRN*NMD/DRMD)*LCVFYN
          NSTTRM    LIM(NSTTR1,-NM,NM)
          STPT      (DRRITE+DRLEFT)*NSTRT
          NSTRAT    (STRT*(1.-LCVRN)+PDRRT*LCVRN*NMD/DRMD)*LCVFYN
          NSTPL1    INT(NSTRAT,0.,TRUE,REACT)
          NSTPLT    LIM(NSTPL1,-NM-NSTTRM,NM-NSTTRM)
          NSPLTD    NSTPLT*57.3
C
C    PITCHING MOMENT COEFFICIENT
          CM1       CMRF*CLIFT*CG/100.+CMGEAR*CMGREF
          CM2       (CMSRF*STAB+CMDERF*DE)*(FSHT-FSCG)/(FSHT-FSCGRF)
          CM        CM1+CM2
C
C    YAWING MOMENT COEFFICIENT
          CN1       (CNBRF+CYB*(FSCG-FSCGRF)/B)*BETA+CNR*R*B/(2.*VTAS)
          CN2       CNDRRF*DR*(FSVT-FSCG)/(FSVT-FSCGRF)+CNDW*DW
          CN        CN1+CN2
C
C    SIDE FORCE COEFFICIENT
          CY        CYDW*DW+CYB*BETA+CYR*R*B/(2.*VTAS)+CYDR*DR
C
C    ROLL MOMENT COEFFICIENT
   ROLL   CL        CLB*BETA+CLDR*DR+CLDW*DW+(CLR*R+CLP*P)*B/(2.*VTAS)
   NROLL  CL        0.
C
C    YAW RATE AND ANGLE
          RD1       CN*QQ*S*B
          RD2       FYN*(FSCG-FSN)
          RD3       FYMF*(FSCG-FSMFR)
          RD4       FYMA*(FSCG-FSMAR)
          RD5       FXN*(BLN-BLCG)
          RD6       FXMFR*(BLMFR-BLCG)
          RD7       FXMFL*(BLMFL-BLCG)
          RD8       FXMAR*(BLMAR-BLCG)
          RD9       FXMAL*(BLMAL-BLCG)
          RD10      THROL*COS(IENG)*(BLCG-BLOL)
          RD11      THRIL*COS(IENG)*(BLCG-BLIL)
          RD12      THRIR*COS(IENG)*(BLCG-BLIR)
          RD13      THROR*COS(IENG)*(BLCG-BLOR)
          RD14      RD1+RD2+RD3+RD4+RD5+RD6
          RD15      RD7+RD8+RD9+RD10+RD11+RD12+RD13
          RD        (RD14+RD15)/IZZ
          R         INT(RD,0.)
          PSI       INT(R,0.)
C
C    ROLL RATE AND ANGLE
   ROLL   PD1       CL*QQ*S*B
   ROLL   PD2       FZMFL*(BLCG-BLMFL)
   ROLL   PD3       FZMFR*(BLCG-BLMFR)
   ROLL   PD4       FZMAL*(BLCG-BLMAL)
   ROLL   PD5       FZMAR*(BLCG-BLMAR)
   ROLL   PD6       FZN*(BLCG-BLN)
   ROLL   PD7       -FYMF*(WLCG-WLGR)
   ROLL   PD8       -FYMA*(WLCG-WLGR)
   ROLL   PD9       -FYN*(WLCG-WLGR)
   ROLL   PD10      THROL*SIN(IENG)*(BLCG-BLOL)
   ROLL   PD11      THRIL*SIN(IENG)*(BLCG-BLIL)
   ROLL   PD12      THRIR*SIN(IENG)*(BLCG-BLIR)
   ROLL   PD13      THROR*SIN(IENG)*(BLCG-BLOR)
   ROLL   PD14      PD1+PD2+PD3+PD4+PD5+PD6+PD7+PD8
   ROLL   PD15      PD9+PD10+PD11+PD12+PD13
   ROLL   PD        (PD14+PD15)/IXX
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      NROLL   PD      0.
              P       INT(PD,0.)
              PHI     INT(P,0.)
     C
     C    DTMIN IS THE MINIMUM INTEGRATION STEP SIZE ALLOWED.
     C    A VALUE OF DTMIN=.01  GIVES GOOD ANSWERS.
              DTMIN   .01
     C
     C    DT BEFORE AND AFTER FAILURE
              DT      DT1-(1.-TRIM)*(DT1-DT2)*LCVFL
     C
     C    FIN STATEMENTS
                      FIN(-.2,YD+ORFAIL+REACT)
                      FIN(-.2,YD+IRFAIL+REACT)
                      FIN(YD+ILFAIL+REACT,.2)
                      FIN(YD+OLFAIL+REACT,.2)
                      FIN(VKTAS,VKSTOF)
                      FIN(I,50.)
                      FIN(ABS(Y),100.)
                      FIN(.00001,DT)
                      FIN(VKST,VKFAIL+.001)
     C
     C    THESE EQUATIONS CHANGE RADIAN MEASURES TO DEGREE MEASURES.
              PHIDEG  PHI*57.3
              PSIDEG  PSI*57.3
              BETADG  BETA*57.3
              DRPLTD  DRPLT*57.3
              NSTDEG  NST*57.3
              NSTRMD  NSTTRM*57.3
              DWDEG   DW*57.3
              PDEG    P*57.3
              RDEG    R*57.3
              YAWNTD  YAWNT*57.3
              YAWMFD  YAWMF*57.3
              YAWMAD  YAWMA*57.3
              RDDEG   RD*57.3
              PDDEG   PD*57.3
              DRTRMD  DRTRIM*57.3
              DRRCTD  DRRCT*57.3
     C
     C
     C    OUTPUT STATEMENTS
                      OUT
                      OUT
                      OUT(T,XD,YD,QQ,BETADG)
                      OUT( ,X,Y)
                      OUT
                      OUT( ,UD,VD,VKTAS,RDDEG,PDDEG)
                      OUT( ,U,V,VKEAS,RDEG,PDEG)
                      OUT( ,UTOT,VTOT,VKTGS,PSIDEG,PHIDEG)
                      OUT
                      OUT(FZAERO, ,FZN)
                      OUT( ,FZMFL, ,FZMFR)
                      OUT( ,FZMAL, ,FZMAR)
                      OUT
                      OUT(FYAERO, ,FYN,MUNSC,MUNSK,YAWNTD)
                      OUT(FYFRIC, ,FYMF,MUMFSC,MUMFSK,YAWMFD)
                      OUT( , ,FYMA,MUMASC,MUMASK,YAWMAD)
                      OUT
                      OUT(FXAERO, ,FXN)
                      OUT(FXFRIC,FXMFL,MUR,FXMFR)
                      OUT( ,FXMAL, ,FXMAR)
                      OUT
                      OUT(IFAIL,THROL,THRIL,THRIR,THROR)
                      OUT( ,THRO, , ,WMD)
                      OUT
```

```
      OUT(TRIM,DRTRMD,NSTRMD,DWDEG)
      OUT( ,DRYDDG)
      OUT(REACT,DRRCTD,NSPLTD)
      OUT( ,DRDEG,NSTDEG)
      OUT
      OUT(SKID,NSK1,MFSK1,MASK1)
      OUT
      OUT
C
C
      END
```

C	2.01800E+01	B	1.30830E+02	S	2.43300E+03	ALPHAD	0.00000E-01	IED	0.00000E-01		
WT	3.19700E+05	IXX	3.76900E+06	IZZ	8.92100E+06	WLCG	1.60600E+01	BLCG	0.00000E-01	CG	-5.00000E+00
WLGR	7.31000E+00	FSVT	1.27550E+02	FSHT	1.31940E+02	FSCGRF	7.05500E+01				
RHOG	2.37700E-03	RHO	2.24600E-03	G	3.22000E+01						
TAU	5.00000E-01	THRAMP	0.00000E-01								
BLOL	-4.60800E+01	WLOL	1.42700E+01	FSOL	5.18330E+01	CONTOL	-1.00000E+00				
BLIL	-2.71670E+01	WLIL	1.20600E+01	FSIL	5.18330E+01	CONTIL	-1.00000E+00				
BLIR	2.71670E+01	WLIR	1.20600E+01	FSIR	5.18330E+01	CONTIR	-1.00000E+00				
BLOR	4.60800E+01	WLOR	1.42700E+01	FSOR	5.18330E+01	CONTOR	1.00000E+00				
BLM	0.00000E-01	FSM	2.82500E+01								
BLMFR	0.00000E-01	FSMFR	0.00000E-01								
BLMFL	0.00000E-01	FSMFL	0.00000E-01								
BLMAR	1.10500E+01	FSMAR	7.39167E+01								
BLMAL	-1.10500E+01	FSMAL	7.39167E+01								
KMFG	0.00000E-01	BMFG	0.00000E-01								
KMAG	1.20000E+04	BMAG	2.00000E+05								
CLB	-1.94820E-01	CLDW	2.48000E-02	CLR	0.00000E-01	CLP	0.00000E-01	CLDR	2.96000E-02		
CNBRF	1.31790E-01	CNR	-1.93400E-01	CNDRRF	-1.16300E-01	CNDW	-2.41000E-03				
CYB	-7.44900E-01	CYR	8.20000E-02	CYDR	1.89100E-01	CYDW	0.00000E-01				
CMRF	-1.00000E-02	CMGEAR	5.00000E-03	CMGREF	-4.60000E-02						
CNDERF	-6.87600E-01	DETOD	9.00000E+00	CMSRF	-1.66170E+00	STBTOD	-1.90000E+00	DNWSHD	-2.00000E+00		
PRT	1.00000E+00	GAINRT	1.50000E+01	DRRTMD	4.70000E+01						
DRYDMD	4.00000E+00	GAINYB	0.00000E-01	GAINYR	3.20000E+00	GAINYP	0.00000E-01	CONYD	1.00000E+00		
DWMD	9.80000E+01	GAINWP	-1.50000E+01	GAINWB	-1.50000E+01						
NPC	8.00000E+00	NSTRTC	1.43000E+01	GAINRT	1.10000E+01	RDNS	1.00000E+00				
LCNEY	1.00000E+00	NUROLL	2.50000E-02	RCR	2.30000E+01	CLIFT	4.70000E-01	CD	6.80000E-02	VKROT	1.80000E+02
DT1	1.00000E+00	DT2	2.00000E-01								
VRD1	4.										
	0.00000E-01		0.00000E-01		0.00000E-01						
	1.00000E+02		-1.20000E+02		0.00000E-01						
	1.50000E+02		-2.50000E+02		0.00000E-01						
	1.80000E+02		-3.70000E+02		0.00000E-01						
IHR1	4.										
	0.00000E-01		2.14000E+04		0.00000E-01						
	6.80000E+01		1.88990E+04		0.00000E-01						
	1.36000E+02		1.70150E+04		0.00000E-01						
	2.04000E+02		1.54950E+04		0.00000E-01						
DRM1	6.										
	0.00000E-01		2.65000E+01		0.00000E-01						
	1.20000E+02		2.50000E+01		0.00000E-01						
	1.40000E+02		2.34000E+01		0.00000E-01						
	1.50000E+02		2.26000E+01		0.00000E-01						
	1.60000E+02		2.08000E+01		0.00000E-01						
	1.80000E+02		1.84000E+01		0.00000E-01						
VKST	0.00000E-01	VKFAIL	1.40000E+02	VKXW	0.00000E-01	TXW	0.00000E-01	VKSTXW	0.00000E-01		
T	0.00000E-01	XD	0.00000E-01	YD	0.00000E-01	QQ	0.00000E-01	BETADG	0.00000E-01		
		X	0.00000E-01	Y	0.00000E-01						
		UD	7.32830E-16	VD	0.00000E-01	VKTAS	0.00000E-01	RDDEG	0.00000E-01	PDDEG	0.00000E-01
		U	0.00000E-01	V	0.00000E-01	VKEAS	0.00000E-01	RDEG	0.00000E-01	PDEG	0.00000E-01
		UTOT	0.00000E-01	VTOT	0.00000E-01	VKTGS	0.00000E-01	PSIDEG	0.00000E-01	PHIDEG	0.00000E-01
FZAERO	3.19700E+05			FZN	4.16080E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.39046E+05			FZMAR	1.39046E+05				

FYAERO	0.00000E-01			FYN	0.00000E-01	MUNSC	0.00000E-01	MUNSK	0.00000E-01	YAWNTD	0.00000E-01
FYFRIC	0.00000E-01			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	0.00000E-01	MUMASC	0.00000E-01	MUMASK	0.00000E-01	YAWMAD	0.00000E-01
FXAERO	8.56000E+04			FXN	1.11406E+04						
FXFRIC	8.56000E+04	FXMFL	0.00000E-01	MUR	2.67751E-01	FXMFR	0.00000E-01				
		FXMAL	3.72297E+04			FXMAR	3.72297E+04				
TFAIL	0.00000E-01	THROL	2.14000E+04	THRIL	2.14000E+04	THRIR	2.14000E+04	THROR	2.14000E+04		
		THRO	2.14000E+04					WMD	0.00000E-01		
TRIM	1.00000E+00	DRTRMD	0.00000E-01	NSTRMD	0.00000E-01	DWDEG	0.00000E-01				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	0.00000E-01	NSTDEG	0.00000E-01						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	1.00000E+00	XD	7.69983E+00	YD	2.51347E-16	QQ	6.65797E-02	EETADG	6.60082E-15		
		X	3.81924E+00	Y	-5.15312E-16						
		UD	7.75000E+00	VD	-6.72712E-16	VKTAS	4.55861E+00	RDDEG	-3.06706E-15	PDDEG	-1.28245E-15
		U	7.69983E+00	V	9.13876E-16	VKEAS	4.43141E+00	RDEG	1.21482E-14	PDEG	-1.66779E-16
		UTOT	7.69983E+00	VTOT	9.13876E-16	VKTGS	4.55881E+00	PSIDEG	-4.93036E-15	PHIDEG	-1.38454E-16
FZAERO	3.19624E+05			FZN	2.67766E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.46424E+05			FZMAR	1.46424E+05				
FYAERO	-1.63197E-11			FYN	-8.32131E-12	MUNSC	-3.31886E-16	MUNSK	-3.21857E-16	YAWNTD	3.32052E-15
FYFRIC	9.64061E-12			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	1.79619E-11	MUMASC	1.02765E-17	MUMASK	9.96593E-18	YAWMAD	-1.02816E-16
FXAERO	8.49370E+04			FXN	6.69414E+02						
FXFRIC	7.99060E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.66059E+03			FXMAR	3.66059E+03				
TFAIL	1.00000E+00	THROL	2.12370E+04	THRIL	2.12370E+04	THRIR	2.12370E+04	THROR	2.12370E+04		
		THRO	2.12370E+04					WMD	-5.31769E+00		
TRIM	1.00000E+00	DRTRMD	-2.26878E-13	NSTRMD	-6.86259E-14	DWDEG	4.87850E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-2.26878E-13	NSTDEG	-6.86259E-14						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	2.00000E+00	XD	1.54157E+01	YD	2.62415E-16	QQ	2.66872E-01	EETADG	-9.49975E-16		
		X	1.53827E+01	Y	-2.09995E-16						
		UD	7.68144E+00	VD	-5.80002E-16	VKTAS	9.12709E+00	RDDEG	-1.08567E-14	PDDEG	6.70466E-16
		U	1.54157E+01	V	-2.55576E-16	VKEAS	8.87202E+00	RDEG	3.07969E-16	PDEG	3.32111E-17
		UTOT	1.54157E+01	VTOT	-2.55576E-16	VKTGS	9.12709E+00	PSIDEG	1.92537E-15	PHIDEG	-2.78495E-16
FZAERO	3.19395E+05			FZN	2.66099E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.46292E+05			FZMAR	1.46292E+05				
FYAERO	-7.18330E-13			FYN	-3.60356E-11	MUNSC	-1.35232E-15	MUNSK	-1.27051E-15	YAWNTD	1.35300E-14
FYFRIC	-5.04026E-12			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01

				FYMA	3.09954E-11	MUMASC	1.03687E-16	MUMASK	9.74144E-17	YAWMAD	-1.03739E-15
FXAERO	8.42506E+04			FXN	6.70247E+02						
FXFRIC	7.98487E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.65731E+03			FXMAR	3.65731E+03				
TFAIL	2.00000E+00	THROL	2.10737E+04	THRIL	2.10737E+04	THRIR	2.10737E+04	THROR	2.10737E+04		
		THRO	2.10737E+04					WMO	-1.06464E+01		
TRIM	1.00000E+00	DRTRMD	4.50550E-14	ASTRMD	1.36551E-14	DWDEG	3.67926E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	4.50550E-14	NSTDEG	1.36551E-14						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.00000E+00	XD	2.30623E+01	YD	5.59350E-17	QD	5.97290E-01	BETADG	3.47015E-17		
		X	3.46275E+01	Y	-6.55960E-17						
		UD	7.61168E+00	VD	4.62062E-16	VKTAS	1.36544E+01	RDDEG	3.48684E-15	PDDEG	1.32087E-16
		U	2.30623E+01	V	1.39668E-17	VKEAS	1.32728E+01	RDEG	-1.40905E-15	PDEG	1.86685E-16
		VTOT	2.30623E+01	VTOT	1.39668E-17	VKTGS	1.36544E+01	PSIDEG	1.04273E-16	PHIDEG	-1.12193E-16
FZAERO	3.19017E+05			FZN	2.68375E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.46090E+05			FZMAR	1.46090E+05				
FYAERO	5.58055E-12			FYN	1.29389E-11	MUNSC	5.00712E-16	MUNSK	4.55395E-16	YAWNTD	-5.00963E-15
FYFRIC	-9.92939E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-1.39318E-11	MUMASC	-3.01895E-17	MUMASK	-2.74571E-17	YAWMAD	3.02046E-16
FXAERO	8.35485E+04			FXN	6.70938E+02						
FXFRIC	7.97542E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.65224E+03			FXMAR	3.65224E+03				
TFAIL	3.00000E+00	THROL	2.09118E+04	THRIL	2.09118E+04	THRIR	2.09118E+04	THROR	2.09118E+04		
		THRO	2.09118E+04					WMO	-1.59274E+01		
TRIM	1.00000E+00	DRTRMD	-8.30362E-15	ASTRMD	-2.52155E-15	DWDEG	-1.12038E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-8.30362E-15	NSTDEG	-2.52155E-15						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	4.00000E+00	XD	3.06386E+01	YD	2.87390E-17	QD	1.05419E+00	BETADG	7.58514E-17		
		X	6.14839E+01	Y	-2.91379E-17						
		UD	7.54077E+00	VD	-1.96154E-16	VKTAS	1.81401E+01	RDDEG	-2.99218E-16	PDDEG	1.48599E-17
		U	3.86386E+01	V	4.05582E-17	VKEAS	1.76332E+01	RDEG	3.45501E-16	PDEG	1.55448E-16
		UTOT	3.86386E+01	VTOT	4.05582E-17	VKTGS	1.81401E+01	PSIDEG	-2.21041E-17	PHIDEG	5.29573E-17
FZAERO	3.18495E+05			FZN	2.68597E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.45817E+05			FZMAR	1.45817E+05				
FYAERO	-1.93583E-12			FYN	-1.02003E-12	MUNSC	-4.36947E-17	MUNSK	-3.64409E-17	YAWNTD	4.37165E-16
FYFRIC	-1.11707E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	9.08320E-13	MUMASC	-2.64949E-18	MUMASK	-2.33092E-18	YAWMAD	2.65082E-17

FXAERO	8.28314E+04			FXN	6.71492E+02						
FXFRIC	7.96236E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.64544E+03			FXMAR	3.64544E+03				
TFAIL	4.00000E+00	THROL	2.07515E+04	THRIL	2.07515E+04	THRIR	2.07515E+04	THROR	2.07515E+04		
		THRO	2.07515E+04					WMD	-2.11598E+01		
TRIM	1.00000E+00	DRTRMD	-3.42832E-16	NSTRMD	-1.04310E-16	DWDEG	-3.12609E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-3.42832E-16	NSTDEG	-1.04310E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	5.00000E+00	XD	3.81435E+01	YD	9.47540E-16	GD	1.63368E+00	BETADG	-1.07848E-17		
		X	9.58809E+01	Y	-1.00114E-17						
		UD	7.46878E+00	VD	6.68537E-17	VKTAS	2.25835E+01	RDDEG	-5.29954E-16	PDDEG	2.36769E-17
		U	3.81435E+01	V	-7.17923E-16	VKEAS	2.19524E+01	RDEG	-1.27273E-16	PDEG	1.88320E-16
		UTOT	3.81435E+01	VTOT	-7.17923E-16	VKTGS	2.25835E+01	PSIDEG	2.50189E-17	PHIDEG	2.23850E-16
FZAERO	3.17832E+05			FZN	2.68765E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.45478E+05			FZMAR	1.45478E+05				
FYAERO	6.41748E-12			FYN	7.03541E-13	MUNSC	2.88865E-17	MUNSK	2.45625E-17	YAWNTD	-2.89010E-16
FYFRIC	-1.37987E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-8.81527E-13	MUMASC	-3.81362E-19	MUMASK	-3.24276E-19	YAWMAD	3.81552E-18
FXAERO	8.21001E+04			FXN	6.71912E+02						
FXFRIC	7.94579E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.63694E+03			FXMAR	3.63694E+03				
TFAIL	5.00000E+00	THROL	2.05926E+04	THRIL	2.05926E+04	THRIR	2.05926E+04	THROR	2.05926E+04		
		THRO	2.05926E+04					WMD	-2.63428E+01		
TRIM	1.00000E+00	DRTRMD	-4.60724E-16	NSTRMD	-1.40450E-16	DWDEG	-6.18255E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-4.60724E-16	NSTDEG	-1.40450E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	6.00000E+00	XD	4.55758E+01	YD	3.34723E-16	GD	2.33265E+00	BETADG	3.32513E-17		
		X	1.37747E+02	Y	-4.68324E-16						
		UD	7.39577E+00	VD	-1.10350E-17	VKTAS	2.69839E+01	RDDEG	2.53189E-16	PDDEG	-3.10096E-18
		U	4.55758E+01	V	2.64477E-17	VKEAS	2.62298E+01	RDEG	1.61469E-17	PDEG	1.69280E-16
		UTOT	4.55758E+01	VTOT	2.64477E-17	VKTGS	2.69839E+01	PSIDEG	-2.90430E-17	PHIDEG	3.95880E-16
FZAERO	3.17033E+05			FZN	2.68880E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.45072E+05			FZMAR	1.45072E+05				
FYAERO	-1.32873E-13			FYN	8.21030E-13	MUNSC	3.02690E-17	MUNSK	2.48552E-17	YAWNTD	-3.02842E-16
FYFRIC	2.33109E-14			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-7.97719E-13	MUMASC	-3.16850E-18	MUMASK	-2.60179E-18	YAWMAD	3.17066E-17
FXAERO	8.13552E+04			FXN	6.72201E+02						
FXFRIC	7.92581E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				

		FXMAL	3.62681E+03			FXMAR	3.62681E+03				
TFAIL	6.00000E+00	THROL	2.04353E+04	THRIL	2.04353E+04	THRIR	2.04353E+04	THROR	2.04353E+04		
		THRO	2.04353E+04					WMO	-3.14758E+01		
TRIM	1.00000E+00	DRTRMD	-1.14830E-15	NSTRMD	-3.50724E-16	DWDEG	-8.47740E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-1.14830E-15	NSTDEG	-3.50724E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	7.00000E+00	XD	5.29347E+01	YD	1.40215E-18	GD	3.14674E+00	BETADG	1.86605E-17		
		X	1.87008E+02	Y	-2.28362E-16						
		UD	7.32179E+00	VD	3.04786E-18	VKTAS	3.13409E+01	RDDEG	1.81281E-16	PDDEG	6.00878E-19
		U	5.29347E+01	V	1.72389E-17	VKEAS	3.04650E+01	RDEG	-2.26206E-18	PDEG	1.62439E-16
		UTOT	5.29347E+01	VTOT	1.72389E-17	VKTGS	3.13409E+01	PSIDEG	-1.71427E-17	PHIDEG	5.58297E-16
FZAERO	3.16102E+05			FZN	2.68946E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.44604E+05			FZMAR	1.44604E+05				
FYAERO	3.47779E-14			FYN	5.72113E-13	MUNSC	2.14836E-17	MUNSK	1.70207E-17	YAWNTD	-2.14944E-16
FYFRIC	-4.51700E-15			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.76630E-13	MUMASC	-1.88381E-18	MUMASK	-1.49247E-18	YAWMAD	1.88475E-17
FXAERO	8.05975E+04			FXN	6.72364E+02						
FXFRIC	7.90254E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.61509E+03			FXMAR	3.61509E+03				
TFAIL	7.00000E+00	THROL	2.02795E+04	THRIL	2.02795E+04	THRIR	2.02795E+04	THROR	2.02795E+04		
		THRO	2.02795E+04					WMO	-3.65580E+01		
TRIM	1.00000E+00	DRTRMD	-7.57623E-16	NSTRMD	-2.31840E-16	DWDEG	-1.08110E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-7.57623E-16	NSTDEG	-2.31840E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	8.00000E+00	XD	6.02191E+01	YD	5.11966E-19	GD	4.07238E+00	BETADG	1.90987E-17		
		X	2.43591E+02	Y	-1.40295E-18						
		UD	7.24691E+00	VD	2.70278E-18	VKTAS	3.56537E+01	RDDEG	-1.86703E-16	PDDEG	1.52560E-18
		U	6.02191E+01	V	2.00716E-17	VKEAS	3.46573E+01	RDEG	-7.36081E-19	PDEG	1.54235E-16
		UTOT	6.02191E+01	VTOT	2.00716E-17	VKTGS	3.56537E+01	PSIDEG	-1.86115E-17	PHIDEG	7.15320E-16
FZAERO	3.15043E+05			FZN	2.68961E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.44074E+05			FZMAR	1.44074E+05				
FYAERO	3.83032E-14			FYN	5.75152E-13	MUNSC	2.16082E-17	MUNSK	1.65017E-17	YAWNTD	-2.16190E-16
FYFRIC	-1.14684E-14			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.86621E-13	MUMASC	-1.91426E-18	MUMASK	-1.46187E-18	YAWMAD	1.91521E-17
FXAERO	7.58275E+04			FXN	6.72404E+02						
FXFRIC	7.87608E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.60184E+03			FXMAR	3.60184E+03				

TFAIL	8.00000E+00	THROL	2.01253E+04	THRIL	2.01253E+04	THRIR	2.01253E+04	THROR	2.01253E+04		
		THRO	2.01253E+04					GMD	-4.15868E+01		
TRIM	1.00000E+00	DRTRMD	-7.65803E-16	NSTRMD	-2.34784E-16	DWDEG	-1.30453E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-7.65803E-16	NSTDEG	-2.34784E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	9.00000E+00	XD	6.74282E+01	YD	2.51171E-19	QQ	5.10580E+00	BETADG	1.85046E-17		
		X	3.07421E+02	Y	-1.05837E-18						
		UD	7.17119E+00	VD	-9.77431E-19	VKTAS	3.99220E+01	RDDEG	1.73999E-16	PDDEG	5.33067E-18
		U	6.74282E+01	V	2.17754E-17	VKEAS	3.88063E+01	RDEG	2.26071E-18	PDEG	1.50283E-16
		UTOT	6.74282E+01	VTOT	2.17754E-17	VKTGS	3.99220E+01	PSIDEG	-1.82912E-17	PHIDEG	8.65338E-16
FZAERO	3.13861E+05			FZN	2.68930E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.43484E+05			FZMAR	1.43484E+05				
FYAERO	3.03679E-14			FYN	5.14244E-13	MUNSC	1.93116E-17	MUNSK	1.42015E-17	YAWNTD	-1.93213E-16
FYFRIC	-4.00724E-14			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.54316E-13	MUMASC	-1.83487E-18	MUMASK	-1.34934E-18	YAWMAD	1.83579E-17
FXAERO	7.50462E+04			FXN	6.72324E+02						
FXFRIC	7.84654E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.58711E+03			FXMAR	3.58711E+03				
TFAIL	9.00000E+00	THROL	1.99727E+04	THRIL	1.99727E+04	THRIR	1.99727E+04	THROR	1.99727E+04		
		THRO	1.99727E+04					GMD	-4.65676E+01		
TRIM	1.00000E+00	DRTRMD	-6.93785E-16	NSTRMD	-2.13102E-16	DWDEG	-1.52343E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-6.93785E-16	NSTDEG	-2.13102E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	1.00000E+01	XD	7.45612E+01	YD	1.19857E-19	QQ	6.24318E+00	BETADG	1.80389E-17		
		X	3.78422E+02	Y	-9.24673E-19						
		UD	7.09468E+00	VD	6.04381E-19	VKTAS	4.41452E+01	RDDEG	-1.92922E-16	PDDEG	1.06143E-17
		U	7.45612E+01	V	2.34730E-17	VKEAS	4.29115E+01	RDEG	1.77466E-19	PDEG	1.45116E-16
		UTOT	7.45612E+01	VTOT	2.34730E-17	VKTGS	4.41452E+01	PSIDEG	-1.79468E-17	PHIDEG	1.01386E-15
FZAERO	3.12561E+05			FZN	2.68852E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.42838E+05			FZMAR	1.42838E+05				
FYAERO	8.57917E-14			FYN	5.13394E-13	MUNSC	1.94632E-17	MUNSK	1.37661E-17	YAWNTD	-1.94729E-16
FYFRIC	-7.97911E-14			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.93185E-13	MUMASC	-1.80195E-18	MUMASK	-1.27468E-18	YAWMAD	1.80285E-17
FXAERO	7.82541E+04			FXN	6.72129E+02						
FXFRIC	7.81402E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.57095E+03			FXMAR	3.57095E+03				
TFAIL	1.00000E+01	THROL	1.98217E+04	THRIL	1.98217E+04	THRIR	1.98217E+04	THROR	1.98217E+04		
		THRO	1.98217E+04					GMD	-5.14938E+01		

TRIM	1.00000E+00	DRTRMD	-6.91739E-16	NSTRMD	-2.12866E-16	DWDEG	-1.73647E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-6.91739E-16	NSTDEG	-2.12866E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	1.10000E+01	XD	8.16174E+01	YD	-5.33050E-21	GD	7.48075E+00	BETADG	1.66443E-17		
		X	4.56518E+02	Y	-8.76264E-19						
		UD	7.01745E+00	VD	4.48834E-18	VKTAS	4.83229E+01	RDDEG	2.05867E-16	PDDEG	1.41446E-17
		U	8.16174E+01	V	2.65567E-17	VKEAS	4.69724E+01	RDEG	-1.93171E-18	PDEG	1.51723E-16
		UTOT	8.16174E+01	VTOT	2.65567E-17	VKTGS	4.83229E+01	PSIDEG	-1.86481E-17	PHIDEG	1.16243E-15
FZAERO	3.11146E+05			FZN	2.68729E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.42136E+05			FZMAR	1.42136E+05				
FYAERO	1.50893E-13			FYN	5.64216E-13	MUNSC	2.15826E-17	MUNSK	1.46697E-17	YAWNTD	-2.15934E-16
FYFRIC	-1.06330E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-6.70546E-13	MUMASC	-1.87385E-18	MUMASK	-1.27366E-18	YAWMAD	1.87479E-17
FXAERO	7.74519E+04			FXN	6.71822E+02						
FXFRIC	7.77864E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.55341E+03			FXMAR	3.55341E+03				
TFAIL	1.10000E+01	THROL	1.96724E+04	THRIL	1.96724E+04	THRIR	1.96724E+04	THROR	1.96724E+04		
		THRO	1.96724E+04					WMD	-5.63669E+01		
TRIM	1.00000E+00	DRTRMD	-7.57730E-16	NSTRMD	-2.33601E-16	DWDEG	-1.97123E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-7.57730E-16	NSTDEG	-2.33601E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	1.20000E+01	XD	8.85959E+01	YD	1.39036E-19	GD	8.81469E+00	BETADG	1.61849E-17		
		X	5.41631E+02	Y	-7.83179E-19						
		UD	6.93955E+00	VD	-4.34503E-18	VKTAS	5.24547E+01	RDDEG	-2.14988E-16	PDDEG	2.04469E-17
		U	8.85959E+01	V	2.50247E-17	VKEAS	5.09667E+01	RDEG	5.06838E-16	PDEG	1.62567E-16
		UTOT	8.85959E+01	VTOT	2.50247E-17	VKTGS	5.24547E+01	PSIDEG	-1.60949E-17	PHIDEG	1.32042E-15
FZAERO	3.09620E+05			FZN	2.68563E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.41382E+05			FZMAR	1.41382E+05				
FYAERO	1.10581E-13			FYN	3.97587E-13	MUNSC	1.52360E-17	MUNSK	9.93865E-18	YAWNTD	-1.52436E-16
FYFRIC	-1.53721E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.51308E-13	MUMASC	-1.59256E-18	MUMASK	-1.03885E-18	YAWMAD	1.59336E-17
FXAERO	7.66403E+04			FXN	6.71407E+02						
FXFRIC	7.74051E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.53455E+03			FXMAR	3.53455E+03				
TFAIL	1.20000E+01	THROL	1.95247E+04	THRIL	1.95247E+04	THRIR	1.95247E+04	THROR	1.95247E+04		
		THRO	1.95247E+04					WMD	-5.11865E+01		
TRIM	1.00000E+00	DRTRMD	-5.53641E-16	NSTRMD	-1.70992E-16	DWDEG	-2.22451E-14				

		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-5.53641E-16	NSTDEG	-1.70992E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	1.30000E+01	XD	9.54963E+01	YD	1.02276E-19	QC	1.02412E+01	BETADG	1.60205E-17		
		X	6.33684E+02	Y	-7.43489E-19						
		UD	6.86104E+00	VD	-3.74618E-18	VKTAS	5.65401E+01	RDDEG	1.67450E-16	PDDEG	2.85822E-17
		U	9.54963E+01	V	2.66997E-17	VKEAS	5.49600E+01	RDEG	4.65614E-18	PDEG	1.84151E-16
		UTOT	9.54963E+01	VTOT	2.66997E-17	VKTGS	5.65401E+01	PSIDEG	-1.59591E-17	PHIDEG	1.49284E-15
FZAERO	3.07989E+05			FZN	2.68355E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.40577E+05			FZMAR	1.40577E+05				
FYAERO	1.77667E-13			FYN	3.91526E-13	MUNSC	1.52411E-17	MUNSK	9.52926E-18	YAWNTD	-1.52487E-16
FYFRIC	-2.14862E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-6.06388E-13	MUMASC	-1.57992E-18	MUMASK	-9.87821E-19	YAWMAD	1.58071E-17
FXAERO	7.58201E+04			FXN	6.70888E+02						
FXFRIC	7.69973E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.51442E+03			FXMAR	3.51442E+03				
TFAIL	1.30000E+01	THROL	1.93786E+04	THRIL	1.93786E+04	THRIR	1.93786E+04	THROR	1.93786E+04		
		THRO	1.93786E+04					WMD	-5.59520E+01		
TRIM	1.00000E+00	DRTRMD	-5.51122E-16	NSTRMD	-1.70521E-16	DWDEG	-2.51549E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-5.51122E-16	NSTDEG	-1.70521E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
I	1.40000E+01	XD	1.02318E+02	YD	9.17296E-20	QC	1.17566E+01	BETADG	1.46163E-17		
		X	7.32598E+02	Y	-6.77904E-19						
		UD	6.78198E+00	VD	-3.07229E-18	VKTAS	6.05789E+01	RDDEG	1.65343E-16	PDDEG	4.37368E-17
		U	1.02318E+02	V	2.60997E-17	VKEAS	5.88860E+01	RDEG	2.31063E-18	PDEG	1.77194E-16
		UTOT	1.02318E+02	VTOT	2.60997E-17	VKTGS	6.05789E+01	PSIDEG	-1.45650E-17	PHIDEG	1.67154E-15
FZAERO	3.06256E+05			FZN	2.68107E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.39723E+05			FZMAR	1.39723E+05				
FYAERO	2.98286E-13			FYN	3.48867E-13	MUNSC	1.40543E-17	MUNSK	8.41099E-18	YAWNTD	-1.40613E-16
FYFRIC	-3.28784E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-6.77651E-13	MUMASC	-1.45103E-18	MUMASK	-8.68387E-19	YAWMAD	1.45175E-17
FXAERO	7.49918E+04			FXN	6.70266E+02						
FXFRIC	7.65640E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.49307E+03			FXMAR	3.49307E+03				
TFAIL	1.40000E+01	THROL	1.92342E+04	THRIL	1.92342E+04	THRIR	1.92342E+04	THROR	1.92342E+04		
		THRO	1.92342E+04					WMD	-7.06632E+01		
TRIM	1.00000E+00	DRTRMD	-5.03817E-16	NSTRMD	-1.56162E-16	DWDEG	-2.77310E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						

		DRDEG	-5.03817E-16	NSTDEG	-1.56162E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	1.50000E+01	XD	1.09060E+02	YD	6.18870E-20	QO	1.33571E+01	BETADG	1.47591E-17		
		X	8.38293E+02	Y	-6.66692E-19						
		UD	6.70242E+00	VD	-1.68128E-18	VKTAS	6.45708E+01	RDDEG	1.80617E-16	PDDEG	5.44916E-17
		U	1.09060E+02	V	2.80912E-17	VKEAS	6.27663E+01	RDEG	2.15212E-18	PDEG	1.83624E-16
		UTOT	1.09060E+02	VTOT	2.80912E-17	VKTGS	6.45708E+01	PSIDEG	-1.47266E-17	PHIDEG	1.85154E-15
FZAERO	3.04426E+05			FZN	2.67821E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.38822E+05			FZMAR	1.38822E+05				
FYAERO	3.90953E-13			FYN	3.54103E-13	MUNSC	1.45763E-17	MUNSK	8.33772E-18	YAWNTD	-1.45836E-16
FYFRIC	-4.09631E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-7.63735E-13	MUMASC	-1.46654E-18	MUMASK	-8.38868E-19	YAWMAD	1.46727E-17
FXAERO	7.41561E+04			FXN	6.69552E+02						
FXFRIC	-1.61065E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.47055E+03			FXMAR	3.47055E+03				
TFAIL	1.50000E+01	THROL	1.90915E+04	THRIL	1.90915E+04	THRIR	1.90915E+04	THROR	1.90915E+04		
		THRO	1.90915E+04					WMO	-7.53195E+01		
TRIM	1.00000E+00	DRTRMD	-5.19830E-16	NSTRMD	-1.61410E-16	DWDEG	-3.05305E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-5.19830E-16	NSTDEG	-1.61410E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	1.60000E+01	XD	1.15723E+02	YD	6.51129E-21	QO	1.50389E+01	BETADG	1.40800E-17		
		X	9.50691E+02	Y	-6.33416E-19						
		UD	6.62242E+00	VD	2.04778E-16	VKTAS	6.85154E+01	RDDEG	1.91204E-16	PDDEG	6.61896E-17
		U	1.15723E+02	V	2.84358E-17	VKEAS	6.66007E+01	RDEG	-1.15990E-16	PDEG	-7.38633E-17
		UTOT	1.15723E+02	VTOT	2.84358E-17	VKTGS	6.85154E+01	PSIDEG	-1.40768E-17	PHIDEG	1.88735E-15
FZAERO	3.02503E+05			FZN	2.67497E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.37877E+05			FZMAR	1.37877E+05				
FYAERO	5.17900E-13			FYN	3.63810E-13	MUNSC	1.53857E-17	MUNSK	8.39842E-18	YAWNTD	-1.53934E-16
FYFRIC	-4.97569E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-8.61379E-13	MUMASC	-1.41168E-18	MUMASK	-7.70577E-19	YAWMAD	1.41239E-17
FXAERO	7.33138E+04			FXN	6.68742E+02						
FXFRIC	7.56257E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.44692E+03			FXMAR	3.44692E+03				
TFAIL	1.60000E+01	THROL	1.89505E+04	THRIL	1.89505E+04	THRIR	1.89505E+04	THROR	1.89505E+04		
		THRO	1.89505E+04					WMO	-7.99208E+01		
TRIM	1.00000E+00	DRTRMD	-5.38824E-16	NSTRMD	-1.67600E-16	DWDEG	-2.72023E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-5.38824E-16	NSTDEG	-1.67600E-16						

SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
I	1.70000E+01	XD	1.22308E+02	YD	4.01702E-20	QQ	1.67991E+01	BETADG	1.34182E-17		
		X	1.06971E+03	Y	-5.98832E-19						
		UD	6.55074E+00	VD	-5.25381E-19	VKTAS	7.24142E+01	RDDEG	1.76977E-16	PDDEG	6.51047E-17
		U	1.22308E+02	V	2.86412E-17	VKEAS	7.03905E+01	RDEG	1.74250E-16	PDEG	-1.48379E-16
		UTOT	1.22308E+02	VTOT	2.86412E-17	VKTGS	7.24142E+01	PSIDEG	-1.33994E-17	PHIDEG	1.76872E-15
FZAERO	3.00490E+05			FZN	2.67082E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.36891E+05			FZMAR	1.36891E+05				
FYAERO	4.84197E-13			FYN	3.17223E-13	MUNSC	1.35540E-17	MUNSK	7.04830E-18	YAWNTD	-1.35608E-16
FYFRIC	-4.89413E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-8.06636E-13	MUMASC	-1.33492E-18	MUMASK	-5.94178E-19	YAWMAD	1.33558E-17
FXAERO	7.25518E+04			FXN	6.67705E+02						
FXFRIC	7.51225E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.42227E+03			FXMAR	3.42227E+03				
TFAIL	1.70000E+01	THROL	1.88328E+04	THRIL	1.88328E+04	THRIR	1.88328E+04	THROR	1.88328E+04		
		THRO	1.88328E+04					WMO	-8.44686E+01		
TRIM	1.00000E+00	DRTRMD	-4.80170E-16	NSTRMD	-1.49614E-16	DWDEG	-2.43052E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-4.80170E-16	NSTDEG	-1.49614E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
I	1.80000E+01	XD	1.28825E+02	YD	6.69577E-20	QQ	1.86371E+01	BETADG	1.27726E-17		
		X	1.19528E+03	Y	-5.66956E-19						
		UD	6.48354E+00	VD	-2.50467E-18	VKTAS	7.62728E+01	RDDEG	1.65187E-16	PDDEG	6.47806E-17
		U	1.28825E+02	V	2.87161E-17	VKEAS	7.41412E+01	RDEG	2.94593E-18	PDEG	-1.49919E-16
		UTOT	1.28825E+02	VTOT	2.87161E-17	VKTGS	7.62728E+01	PSIDEG	-1.27429E-17	PHIDEG	1.61215E-15
FZAERO	2.98388E+05			FZN	2.66601E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.35864E+05			FZMAR	1.35864E+05				
FYAERO	4.62110E-13			FYN	2.78022E-13	MUNSC	1.20356E-17	MUNSK	5.95088E-18	YAWNTD	-1.20416E-16
FYFRIC	-4.86977E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-7.64999E-13	MUMASC	-1.26662E-18	MUMASK	-5.26270E-19	YAWMAD	1.26726E-17
FXAERO	7.18320E+04			FXN	6.66502E+02						
FXFRIC	7.45971E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.39660E+03			FXMAR	3.39660E+03				
TFAIL	1.80000E+01	THROL	1.87289E+04	THRIL	1.87289E+04	THRIR	1.87289E+04	THROR	1.87289E+04		
		THRO	1.87289E+04					WMO	-8.89695E+01		
TRIM	1.00000E+00	DRTRMD	-4.29748E-16	NSTRMD	-1.34133E-16	DWDEG	-2.19334E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-4.29748E-16	NSTDEG	-1.34133E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				

T	1.90000E+01	XD	1.35274E+02	YD	-1.10957E-19	QQ	2.05500E+01	BETADG	1.25000E-17		
		X	1.32734E+03	Y	-5.48138E-19						
		UD	6.41574E+00	VD	9.94790E-18	VKTAS	8.00914E+01	RDDEG	2.11991E-16	PDDEG	6.09188E-17
		U	1.35274E+02	V	2.95101E-17	VKEAS	7.78532E+01	RDEG	-2.51800E-18	PDEG	-1.49307E-16
		UTOT	1.35274E+02	VTOT	2.95101E-17	VKTGS	8.00914E+01	PSIDEG	-1.25470E-17	PHIDEG	1.46152E-15
FZAERO	2.96201E+05			FZN	2.66086E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.34796E+05			FZMAR	1.34796E+05				
FYAERO	5.56715E-13			FYN	3.87773E-13	MUNSC	1.65300E-17	MUNSK	7.75470E-18	YAWNTD	-1.65383E-16
FYFRIC	-4.57946E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-8.45719E-13	MUMASC	-1.25751E-18	MUMASK	-5.89936E-19	YAWMAD	1.25814E-17
FXAERO	7.11042E+04			FXN	6.65216E+02						
FXFRIC	7.40502E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.36990E+03			FXMAR	3.36990E+03				
TFAIL	1.90000E+01	THROL	1.86260E+04	THRIL	1.86260E+04	THRIR	1.86260E+04	THROR	1.86260E+04		
		THRO	1.86260E+04					WMD	-9.34238E+01		
TRIM	1.00000E+00	DRTRMD	-5.66492E-16	NSTRMD	-1.77114E-16	DWDEG	-1.96832E-14				
		DRYDEG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-5.66492E-16	NSTDEG	-1.77114E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				

T	2.00000E+01	XD	1.41656E+02	YD	7.69875E-20	QQ	2.25346E+01	BETADG	1.40495E-17		
		X	1.46591E+03	Y	-5.99556E-19						
		UD	6.34739E+00	VD	-4.26150E-18	VKTAS	8.38698E+01	RDDEG	-1.96734E-16	PDDEG	6.22506E-17
		U	1.41656E+02	V	3.47328E-17	VKEAS	8.15259E+01	RDEG	3.13740E-18	PDEG	-1.36475E-16
		UTOT	1.41656E+02	VTOT	3.47328E-17	VKTGS	8.38698E+01	PSIDEG	-1.40175E-17	PHIDEG	1.31976E-15
FZAERO	2.93931E+05			FZN	2.65540E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.33689E+05			FZMAR	1.33689E+05				
FYAERO	4.25648E-13			FYN	2.92109E-13	MUNSC	1.25098E-17	MUNSK	5.55542E-18	YAWNTD	-1.25161E-16
FYFRIC	-4.67958E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-7.60067E-13	MUMASC	-1.39456E-18	MUMASK	-5.19302E-19	YAWMAD	1.39525E-17
FXAERO	7.03688E+04			FXN	6.63850E+02						
FXFRIC	7.34829E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.34222E+03			FXMAR	3.34222E+03				
TFAIL	2.00000E+01	THROL	1.85243E+04	THRIL	1.85243E+04	THRIR	1.85243E+04	THROR	1.85243E+04		
		THRO	1.85243E+04					WMD	-9.78311E+01		
TRIM	1.00000E+00	DRTRMD	-4.47429E-16	NSTRMD	-1.40125E-16	DWDEG	-1.77493E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-4.47429E-16	NSTDEG	-1.40125E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				

T	2.10000E+01	XD	1.47969E+02	YD	-1.56187E-20	QD	2.45879E+01	BETADG	1.21750E-17		
		X	1.61063E+03	Y	-5.27600E-19						
		UD	6.27853E+00	VD	3.15945E-18	VKTAS	8.76075E+01	RDDEG	1.68352E-16	PDDEG	6.07515E-17
		U	1.47969E+02	V	3.14403E-17	VKEAS	8.61592E+01	RDEG	5.29990E-20	PDEG	-1.08246E-16
		UTOT	1.47969E+02	VTOT	3.14403E-17	VKTGS	8.76075E+01	PSIDEG	-1.21811E-17	PHIDEG	1.20455E-15
FZAERO	2.91583E+05			FZN	2.64963E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.32544E+05			FZMAR	1.32544E+05				
FYAERO	4.88058E-13										
FYFRIC	-4.56689E-13			FYN	3.09560E-13	MUNSC	1.34209E-17	MUNSK	5.62750E-18	YAWNTD	-1.34276E-16
				FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-7.66250E-13	MUMASC	-1.21674E-18	MUMASK	-5.10191E-19	YAWMAD	1.21735E-17
FXAERO	6.96264E+04										
FXFRIC	2.28959E+03	FXMFL	0.00000E-01	FXN	6.62408E+02						
		FXMAL	3.31359E+03	MUR	2.50000E-02	FXMFR	0.00000E-01				
						FXMAR	3.31359E+03				
TFAIL	2.10000E+01	THROL	1.84236E+04	THRIL	1.84236E+04	THRIR	1.84236E+04	THROR	1.84236E+04		
		THRO	1.84236E+04					WMD	-1.02191E+02		
TRIM	1.00000E+00	DRTRMD	-4.66896E-16	NSTRMD	-1.46466E-16	DWDEG	-1.64446E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-4.66896E-16	NSTDEG	-1.46466E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	2.20000E+01	XD	1.54213E+02	YD	8.41021E-20	QD	2.67068E+01	BETADG	1.32267E-17		
		X	1.76172E+03	Y	-5.61049E-19						
		UD	6.20921E+00	VD	-4.36845E-18	VKTAS	9.13043E+01	RDDEG	1.73153E-16	PDDEG	6.67653E-17
		U	1.54213E+02	V	3.55974E-17	VKEAS	8.87527E+01	RDEG	1.01836E-18	PDEG	-9.53684E-17
		UTOT	1.54213E+02	VTOT	3.55974E-17	VKTGS	9.13043E+01	PSIDEG	-1.31955E-17	PHIDEG	1.09747E-15
FZAERO	2.89161E+05			FZN	2.64357E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.31362E+05			FZMAR	1.31362E+05				
FYAERO	4.58674E-13										
FYFRIC	-5.02047E-13			FYN	2.61260E-13	MUNSC	1.15253E-17	MUNSK	4.55026E-18	YAWNTD	-1.15310E-16
				FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-7.63307E-13	MUMASC	-1.31912E-18	MUMASK	-5.20798E-19	YAWMAD	1.31978E-17
FXAERO	6.88776E+04										
FXFRIC	7.22901E+03	FXMFL	0.00000E-01	FXN	6.60893E+02						
		FXMAL	3.28406E+03	MUR	2.50000E-02	FXMFR	0.00000E-01				
						FXMAR	3.28406E+03				
TFAIL	2.20000E+01	THROL	1.83240E+04	THRIL	1.83240E+04	THRIR	1.83240E+04	THROR	1.83240E+04		
		THRO	1.83240E+04					WMD	-1.06503E+02		
TRIM	1.00000E+00	DRTRMD	-4.09936E-16	NSTRMD	-1.28810E-16	DWDEG	-1.50315E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-4.09936E-16	NSTDEG	-1.28810E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	2.30000E+01	XD	1.60387E+02	YD	7.50926E-20	QD	2.88882E+01	BETADG	1.24598E-17		

		X	1.91903E+03	Y	-5.34600E-19						
		UD	6.13948E+00	VD	-3.67040E-18	VKTAS	9.49599E+01	RDDEG	1.7119E-16	PDDEG	6.04943E-17
		U	1.60387E+02	V	3.54357E-17	VKEAS	9.23662E+01	RDEG	2.16562E-18	PDEG	-8.47165E-17
		UTOT	1.60387E+02	VTOT	3.54357E-17	VKTGS	9.49599E+01	PSIDEG	-1.26329E-17	PHIDEG	1.00881E-15
	FZAERO	2.86666E+05		FZN	2.63723E+04						
			FZMFL	0.00000E-01		FZMFR	0.00000E-01				
			FZMAL	1.30147E+05		FZMAR	1.30147E+05				
	FYAERO	4.18314E-13		FYN	2.52899E-13	MUNSC	1.11030E-17	MUNSK	4.11452E-18	YAWNTD	-1.11086E-16
	FYFRIC	-4.54755E-13		FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-7.07654E-13	MUMASC	-1.25944E-18	MUMASK	-4.66717E-19	YAWMAD	1.26007E-17
	FXAERO	6.81229E+04		FXN	6.59307E+02						
	FXFRIC	7.16665E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01			
			FXMAL	3.25367E+03			FXMAR	3.25367E+03			
	TFAIL	2.30000E+01	THROL	1.82256E+04	THRIL	1.82256E+04	THRIR	1.82256E+04	THROR	1.82256E+04	
			THRO	1.82256E+04					WMD	-1.10767E+02	
	TRIM	1.00000E+00	DRTRMD	-3.94947E-16	NSTRMD	-1.24303E-16	DWDEG	-1.38614E-14			
			DRYDDG	0.00000E-01							
	REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01					
			DRDEG	-3.94947E-16	NSTDEG	-1.24303E-16					
	SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01			
95	T	2.40000E+01	XD	1.66492E+02	YD	-3.62669E-20	QD	3.11290E+01	BETADG	1.24045E-17	
			X	2.08248E+03	Y	-5.19685E-19					
			UD	6.06938E+00	VD	4.23646E-18	VKTAS	9.85742E+01	RDDEG	2.04716E-16	PDDEG	5.96683E-17
			U	1.66492E+02	V	3.60426E-17	VKEAS	9.58194E+01	RDEG	-1.55565E-18	PDEG	-7.79875E-17
			UTOT	1.66492E+02	VTOT	3.60426E-17	VKTGS	9.85742E+01	PSIDEG	-1.24170E-17	PHIDEG	9.29520E-16
	FZAERO	2.84184E+05		FZN	2.63062E+04						
			FZMFL	0.00000E-01		FZMFR	0.00000E-01				
			FZMAL	1.28899E+05		FZMAR	1.28899E+05				
	FYAERO	4.90608E-13		FYN	3.17312E-13	MUNSC	1.38549E-17	MUNSK	4.80257E-18	YAWNTD	-1.38618E-16
	FYFRIC	-4.48546E-13		FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-7.65859E-13	MUMASC	-1.24391E-18	MUMASK	-4.31164E-19	YAWMAD	1.24454E-17
	FXAERO	6.73628E+04		FXN	6.57654E+02						
	FXFRIC	7.10259E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01			
			FXMAL	3.22247E+03			FXMAR	3.22247E+03			
	TFAIL	2.40000E+01	THROL	1.81282E+04	THRIL	1.81282E+04	THRIR	1.81282E+04	THROR	1.81282E+04	
			THRO	1.81282E+04					WMD	-1.14983E+02	
	TRIM	1.00000E+00	DRTRMD	-4.77841E-16	NSTRMD	-1.50637E-16	DWDEG	-1.27730E-14			
			DRYDDG	0.00000E-01							
	REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01					
			DRDEG	-4.77841E-16	NSTDEG	-1.50637E-16					
	SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01			
	T	2.50000E+01	XD	1.72526E+02	YD	1.34576E-19	QD	3.34263E+01	BETADG	1.23148E-17	
			X	2.25199E+03	Y	-5.11046E-19					

		UD	5.99895E+00	VD	-8.02252E-18	VKTAS	1.02147E+02	RDDEG	1.53007E-16	PDDEG	6.42959E-17
		U	1.72526E+02	V	3.70790E-17	VKEAS	9.92922E+01	RDEG	2.30243E-18	PDEG	-5.50655E-17
		UTOT	1.72526E+02	VTOT	3.70790E-17	VKTGS	1.02147E+02	PSIDEG	-1.22701E-17	PHIDEG	8.5788[illegible]E-16
	FZAERO	2.81477E+05		FZN	2.62375E+04						
			FZMFL 0.00000E-01			FZMFR	0.00000E-01				
			FZMAL 1.27620E+05			FZMAR	1.27620E+05				
	FYAERO	4.03681E-13		FYN	1.95395E-13	MUNSC	8.92590E-18	MUNSK	2.88252E-18	YAWNTD	-6.93036E-17
	FYFRIC	-4.83333E-13		FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-6.78728E-13	MUMASC	-1.22503E-18	MUMASK	-3.95610E-19	YAWMAD	1.22564E-17
	FXAERO	6.65979E+04		FXN	6.55937E+02						
	FXFRIC	7.03692E+03	FXMFL 0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
			FXMAL 3.19049E+03			FXMAR	3.19049E+03				
	TFAIL	2.50000E+01	THROL 1.80320E+04	THRIL	1.80320E+04	THRIR	1.80320E+04	THROR	1.80320E+04		
			THRO 1.80320E+04					WMD	-1.19151E+02		
	TRIM	1.00000E+00	DRTRMD -3.23576E-16	NSTRMD	-1.02170E-16	DWDEG	-1.20423E-14				
			DRYDDG 0.00000E-01								
	REACT	0.00000E-01	DRRCTD 0.00000E-01	NSPLTD	0.00000E-01						
			DRDEG -3.23576E-16	NSTDEG	-1.02170E-16						
	SKID	0.00000E-01	NSK1 0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T		2.60000E+01	XD 1.78490E+02	YD	8.00663E-20	QQ	3.57771E+01	BETADG	1.24641E-17		
			X 2.42750E+03	Y	-5.12200E-19						
		UD	5.92823E+00	VD	-4.17286E-18	VKTAS	1.05678E+02	RDDEG	1.73816E-16	PDDEG	5.96777E-17
		U	1.78490E+02	V	3.88256E-17	VKEAS	1.02724E+02	RDEG	1.30896E-18	PDEG	-5.26624E-17
		UTOT	1.78490E+02	VTOT	3.88256E-17	VKTGS	1.05678E+02	PSIDEG	-1.24384E-17	PHIDEG	7.96105E-16
	FZAERO	2.78788E+05		FZN	2.61663E+04						
			FZMFL 0.00000E-01			FZMFR	0.00000E-01				
			FZMAL 1.26311E+05			FZMAR	1.26311E+05				
	FYAERO	4.07186E-13		FYN	2.34254E-13	MUNSC	1.84643E-17	MUNSK	3.13443E-18	YAWNTD	-1.04696E-16
	FYFRIC	-4.48617E-13		FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-6.82871E-13	MUMASC	-1.24258E-18	MUMASK	-3.72195E-19	YAWMAD	1.24320E-17
	FXAERO	6.58286E+04		FXN	6.54158E+02						
	FXFRIC	6.96971E+03	FXMFL 0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
			FXMAL 3.15778E+03			FXMAR	3.15778E+03				
	TFAIL	2.60000E+01	THROL 1.79369E+04	THRIL	1.79369E+04	THRIR	1.79369E+04	THROR	1.79369E+04		
			THRO 1.79369E+04					WMD	-1.27083E+02		
	TRIM	1.00000E+00	DRTRMD -3.71419E-16	NSTRMD	-1.17462E-16	DWDEG	-1.11516E-14				
			DRYDDG 0.00000E-01								
	REACT	0.00000E-01	DRRCTD 0.00000E-01	NSPLTD	0.00000E-01						
			DRDEG -3.71419E-16	NSTDEG	-1.17462E-16						
	SKID	0.00000E-01	NSK1 0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T		2.70000E+01	XD 1.84382E+02	YD	-6.28649E-20	QQ	3.81785E+01	BETADG	1.16332E-17		
			X 2.60895E+03	Y	-4.72744E-19						
		UD	5.85728E+00	VD	5.80625E-18	VKTAS	1.09167E+02	RDDEG	-1.62235E-16	PDDEG	5.55149E-17
		U	1.84382E+02	V	3.74338E-17	VKEAS	1.06116E+02	RDEG	-1.99598E-18	PDEG	-5.34130E-17

		UTOT	1.84382E+02	VTOT	3.74338E-17	VKTGS	1.09167E+02	PSIDEG	-1.16527E-17	PHIDEG	7.43480E-16
FZAERO	2.76043E+05			FZN	2.60928E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.24975E+05			FZMAR	1.24975E+05				
FYAERO	4.74971E-13			FYN	3.04568E-13	MUNSC	1.34564E-17	MUNSK	3.71949E-18	YAWNTD	-1.34632E-16
FYFRIC	-4.17323E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-7.21884E-13	MUMASC	-1.16747E-18	MUMASK	-3.22700E-19	YAWMAD	1.16206E-17
FXAERO	6.50555E+04			FXN	6.52521E+02						
FXFRIC	6.98186E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.12437E+03			FXMAR	3.12437E+03				
TFAIL	2.70000E+01	THROL	1.78430E+04	THRIL	1.78430E+04	THRIR	1.78430E+04	THROR	1.78430E+04		
		THRO	1.78430E+04					WMD	-1.35901E+02		
TRIM	1.00000E+00	DRTRMD	-4.60356E-16	NSTRMD	-1.45818E-16	DWDEG	-1.03518E-14				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-4.60356E-16	NSTDEG	-1.45818E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	2.80000E+01	XD	1.90204E+02	YD	-4.39305E-20	GD	4.06274E+01	BETADG	1.11709E-17		
		X	2.79625E+03	Y	-4.49167E-19						
		UD	5.78612E+00	VD	4.33265E-18	VKTAS	1.12613E+02	RDDEG	-1.71943E-16	PDDEG	5.78433E-17
		U	1.90204E+02	V	3.70811E-17	VKEAS	1.09466E+02	RDEG	-2.03961E-18	PDEG	-4.62262E-17
		UTOT	1.90204E+02	VTOT	3.70811E-17	VKTGS	1.12613E+02	PSIDEG	-1.11841E-17	PHIDEG	6.94791E-16
FZAERO	2.73242E+05			FZN	2.60171E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.23612E+05			FZMAR	1.23612E+05				
FYAERO	4.77844E-13			FYN	2.74712E-13	MUNSC	1.23663E-17	MUNSK	3.13565E-18	YAWNTD	-1.23725E-16
FYFRIC	-4.34827E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-7.09539E-13	MUMASC	-1.12122E-18	MUMASK	-2.84300E-19	YAWMAD	1.12178E-17
FXAERO	6.42790E+04			FXN	6.50429E+02						
FXFRIC	6.83105E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.09031E+03			FXMAR	3.09031E+03				
TFAIL	2.80000E+01	THROL	1.77501E+04	THRIL	1.77501E+04	THRIR	1.77501E+04	THROR	1.77501E+04		
		THRO	1.77501E+04					WMD	-1.44612E+02		
TRIM	1.00000E+00	DRTRMD	-4.23817E-16	NSTRMD	-1.34453E-16	DWDEG	-9.72848E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-4.23817E-16	NSTDEG	-1.34453E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	2.90000E+01	XD	1.95955E+02	YD	-2.02680E-21	GD	4.31212E+01	BETADG	1.04457E-17		
		X	2.98933E+03	Y	-4.32357E-19						
		UD	5.71481E+00	VD	1.31963E-18	VKTAS	1.16018E+02	RDDEG	-1.67900E-16	PDDEG	6.06968E-17
		U	1.95955E+02	V	3.70902E-17	VKEAS	1.12776E+02	RDEG	-1.52461E-18	PDEG	-3.96368E-17
		UTOT	1.95955E+02	VTOT	3.70902E-17	VKTGS	1.16018E+02	PSIDEG	-1.08463E-17	PHIDEG	6.52781E-16

FZAERO	2.70391E+05			FZN	2.59393E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.22226E+05			FZMAR	1.22226E+05				
FYAERO	4.69380E-13										
FYFRIC	-4.56278E-13			FYN	2.33897E-13	MUNSC	1.08048E-17	MUNSK	2.49586E-18	YAWNTD	-1.08102E-16
				FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-6.90175E-13	MUMASC	-1.08743E-18	MUMASK	-2.51192E-19	YAWMAD	1.08798E-17
FXAERO	6.34996E+04										
FXFRIC	6.75976E+03			FXN	6.46484E+02						
		FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.05564E+03			FXMAR	3.05564E+03				
TFAIL	2.90000E+01	THROL	1.76584E+04	THRIL	1.76584E+04	THRIR	1.76584E+04	THROR	1.76584E+04		
		THRO	1.76584E+04					WMD	-1.53217E+02		
TRIM	1.00000E+00	DRTRMD	-3.73352E-16	NSTRMD	-1.18626E-16	DWDEG	-9.19716E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-3.73352E-16	NSTDEG	-1.18626E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.00000E+01	XD	2.01634E+02	YD	-1.87363E-20	QQ	4.56568E+01	BETADG	1.07669E-17		
		X	3.18813E+03	Y	-4.27743E-19						
		UD	5.64337E+00	VD	2.65817E-18	VKTAS	1.19380E+02	RDDEG	-1.80647E-16	PDDEG	5.45146E-17
		U	2.01634E+02	V	3.78879E-17	VKEAS	1.16044E+02	RDEG	-9.81851E-19	PDEG	-4.53762E-17
		UTOT	2.01634E+02	VTOT	3.78879E-17	VKTGS	1.19380E+02	PSIDEG	-1.07723E-17	PHIDEG	6.12598E-16
FZAERO	2.67491E+05			FZN	2.58596E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.20816E+05			FZMAR	1.20816E+05				
FYAERO	4.36196E-13										
FYFRIC	-4.09804E-13			FYN	2.44771E-13	MUNSC	1.11494E-17	MUNSK	2.32697E-18	YAWNTD	-1.11549E-16
				FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-6.54574E-13	MUMASC	-1.07829E-18	MUMASK	-2.25048E-19	YAWMAD	1.07883E-17
FXAERO	6.27179E+04										
FXFRIC	6.68727E+03			FXN	6.46489E+02						
		FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.02039E+03			FXMAR	3.02039E+03				
TFAIL	3.00000E+01	THROL	1.75679E+04	THRIL	1.75679E+04	THRIR	1.75679E+04	THROR	1.75679E+04		
		THRO	1.75679E+04					WMD	-1.61715E+02		
TRIM	1.00000E+00	DRTRMD	-3.83749E-16	NSTRMD	-1.22115E-16	DWDEG	-8.50833E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-3.83749E-16	NSTDEG	-1.22115E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.10000E+01	XD	2.07241E+02	YD	-8.62734E-20	QQ	4.82317E+01	BETADG	1.10175E-17		
		X	3.39257E+03	Y	-4.35159E-19						
		UD	5.57186E+00	VD	7.56436E-18	VKTAS	1.22701E+02	RDDEG	-1.49079E-16	PDDEG	5.07571E-17
		U	2.07241E+02	V	3.98477E-17	VKEAS	1.19272E+02	RDEG	-2.61305E-18	PDEG	-3.78129E-17
		UTOT	2.07241E+02	VTOT	3.98477E-17	VKTGS	1.22701E+02	PSIDEG	-1.10413E-17	PHIDEG	5.74872E-16
FZAERO	2.64547E+05			FZN	2.57779E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				

		FZMAL	1.19384E+05			FZMAR	1.19384E+05				
FYAERO	4.56661E-13			FYN	2.94853E-13	MUNSC	1.32267E-17	MUNSK	2.46946E-18	YAWNTD	-1.32333E-16
FYFRIC	-3.81558E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-6.76411E-13	MUMASC	-1.10671E-18	MUMASK	-2.06625E-19	YAWMAD	1.10726E-17
FXAERO	6.19343E+04			FXN	6.44447E+02						
FXFRIC	6.61367E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.98461E+03			FXMAR	2.98461E+03				
TFAIL	3.10000E+01	THROL	1.74785E+04	THRIL	1.74785E+04	THRIR	1.74785E+04	THROR	1.74785E+04		
		THRO	1.74785E+04					WMD	-1.70106E+02		
TRIM	1.00000E+00	DRTRMD	-4.48171E-16	NSTRMD	-1.42830E-16	DWDEG	-8.05589E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DPDEG	-4.48171E-16	NSTDEG	-1.42830E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.20000E+01	XD	2.12777E+02	YD	4.80292E-20	QD	5.08429E+01	BETADG	1.10493E-17		
		X	3.60259E+03	Y	-4.25206E-19						
		UD	5.50030E+00	VD	-2.16503E-18	VKTAS	1.25978E+02	RDDEG	1.77072E-16	PDDEG	5.30669E-17
		U	2.12777E+02	V	4.10304E-17	VKEAS	1.22458E+02	RDEG	5.50642E-19	PDEG	-2.78689E-17
		UTOT	2.12777E+02	VTOT	4.10304E-17	VKTGS	1.25978E+02	PSIDEG	-1.10364E-17	PHIDEG	5.41290E-16
FZAERO	2.61561E+05			FZN	2.56945E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.17933E+05			FZMAR	1.17933E+05				
FYAERO	3.77426E-13			FYN	2.01646E-17	MUNSC	9.33644E-18	MUNSK	1.54029E-18	YAWNTD	-9.34111E-17
FYFRIC	-3.98921E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-6.00567E-13	MUMASC	-1.10325E-18	MUMASK	-1.82009E-19	YAWMAD	1.10380E-17
FXAERO	6.11492E+04			FXN	6.42362E+02						
FXFRIC	6.53902E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.94833E+03			FXMAR	2.94833E+03				
TFAIL	3.20000E+01	THROL	1.73902E+04	THRIL	1.73902E+04	THRIR	1.73902E+04	THROR	1.73902E+04		
		THRO	1.73902E+04					WMD	-1.76390E+02		
TRIM	1.00000E+00	DRTRMD	-3.27622E-16	NSTRMD	-1.04567E-16	DWDEG	-7.70132E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DPDEG	-3.27622E-16	NSTDEG	-1.04567E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.30000E+01	XD	2.18242E+02	YD	5.41408E-20	QD	5.34879E+01	BETADG	1.08797E-17		
		X	3.81811E+03	Y	-4.16490E-19						
		UD	5.42874E+00	VD	-2.76260E-18	VKTAS	1.29214E+02	RDDEG	-1.99865E-16	PDDEG	5.98618E-17
		U	2.18242E+02	V	4.14382E-17	VKEAS	1.25603E+02	RDEG	-7.14566E-19	PDEG	-2.02936E-17
		UTOT	2.18242E+02	VTOT	4.14382E-17	VKTGS	1.29214E+02	PSIDEG	-1.08655E-17	PHIDEG	5.13147E-16
FZAERO	2.58536E+05			FZN	2.56094E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.16463E+05			FZMAR	1.16463E+05				

FYAERO	4.22572E-13			FYN	1.84338E-13	MUNSC	8.87597E-18	MUNSK	1.27398E-18	YAWNTD	-8.88041E-17
FYFRIC	-4.50001E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-6.34339E-13	MUMASC	-1.08886E-18	MUMASK	-1.56285E-19	YAWMAD	1.08940E-17
FXAERO	6.03630E+04			FXN	6.40234E+02						
FXFRIC	6.46340E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.91158E+03			FXMAR	2.91158E+03				
TFAIL	3.30000E+01	THROL	1.73031E+04	THRIL	1.73031E+04	THRIR	1.73031E+04	THROR	1.73031E+04		
		THRO	1.73031E+04					WMO	-1.86567E+02		
TRIM	1.00000E+00	DRTRMD	-3.11439E-16	NSTRMD	-9.95486E-17	DWDEG	-7.39280E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-3.11439E-16	NSTDEG	-9.95486E-17						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.40000E+01	XD	2.23635E+02	YD	-1.32130E-20	GO	5.61641E+01	BETADG	1.03680E-17		
		X	4.03905E+03	Y	-3.90291E-19						
		UD	5.35721E+00	VD	1.83056E-16	VKTAS	1.32407E+02	RDDEG	1.92383E-16	PDDEG	4.20749E-17
		U	2.23635E+02	V	4.04648E-17	VKEAS	1.28706E+02	RDEG	3.73914E-19	PDEG	-2.98776E-17
		UTOT	2.23635E+02	VTOT	4.04648E-17	VKTGS	1.32407E+02	PSIDEG	-1.03713E-17	PHIDEG	4.87995E-16
FZAERO	2.55476E+05			FZN	2.55227E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.14977E+05			FZMAR	1.14977E+05				
FYAERO	3.34966E-13			FYN	2.22618E-13	MUNSC	1.00801E-17	MUNSK	1.23348E-18	YAWNTD	-1.00852E-16
FYFRIC	-3.16291E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.38909E-13	MUMASC	-1.03437E-18	MUMASK	-1.26573E-19	YAWMAD	1.03469E-17
FXAERO	5.95763E+04			FXN	6.38068E+02						
FXFRIC	6.38690E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.87441E+03			FXMAR	2.87441E+03				
TFAIL	3.40000E+01	THROL	1.72171E+04	THRIL	1.72171E+04	THRIR	1.72171E+04	THROR	1.72171E+04		
		THRO	1.72171E+04					WMO	-1.94637E+02		
TRIM	1.00000E+00	DRTRMD	-3.46812E-16	NSTRMD	-1.11399E-16	DWDEG	-8.87176E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-3.46812E-16	NSTDEG	-1.11399E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.50000E+01	XD	2.28956E+02	YD	6.11318E-20	GO	5.88688E+01	BETADG	1.04380E-17		
		X	4.26535E+03	Y	-3.92189E-19						
		UD	5.28574E+00	VD	-2.83373E-18	VKTAS	1.35557E+02	RDDEG	1.68552E-16	PDDEG	5.05605E-17
		U	2.28956E+02	V	4.17076E-17	VKEAS	1.31769E+02	RDEG	9.49819E-19	PDEG	-2.07755E-17
		UTOT	2.28956E+02	VTOT	4.17076E-17	VKTGS	1.35557E+02	PSIDEG	-1.04227E-17	PHIDEG	4.62628E-16
FZAERO	2.52383E+05			FZN	2.54347E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.13474E+05			FZMAR	1.13474E+05				
FYAERO	3.51945E-13			FYN	1.72755E-13	MUNSC	8.22715E-18	MUNSK	8.34920E-19	YAWNTD	-8.23126E-17
FYFRIC	-3.80080E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01

				FYMA	-5.52835E-13	MUMASC	-1.04146E-18	MUMASK	-1.05691E-19	YAWMAD	1.04198E-17
FXAERO	5.87894E+04			FXN	6.35866E+02						
FXFRIC	6.30957E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.83685E+03			FXMAR	2.83685E+03				
TFAIL	3.50000E+01	THROL	1.71322E+04	THRIL	1.71322E+04	THRIR	1.71322E+04	THROR	1.71322E+04		
		THRO	1.71322E+04					WMD	-2.02599E+02		
TRIM	1.00000E+00	DRTRMD	-2.84544E-16	NSTRMD	-9.29219E-17	DWDEG	-6.62778E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-2.84544E-16	NSTDEG	-9.29219E-17						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.60000E+01	XD	2.34206E+02	YD	1.54012E-20	QD	6.15995E+01	BETADG	1.05971E-17		
		X	4.49694E+03	Y	-3.93028E-19						
		UD	5.21437E+00	VD	7.84164E-19	VKTAS	1.38666E+02	RDDEG	1.91573E-16	PDDEG	4.52173E-17
		U	2.34206E+02	V	4.33143E-17	VKEAS	1.34791E+02	RDEG	2.78859E-19	PDEG	-2.44747E-17
		UTOT	2.34206E+02	VTOT	4.33143E-17	VKTGS	1.38666E+02	PSIDEG	-1.05933E-17	PHIDEG	4.39415E-16
FZAERO	2.49260E+05			FZN	2.53452E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.11958E+05			FZMAR	1.11958E+05				
FYAERO	3.47699E-13			FYN	2.09481E-13	MUNSC	9.70705E-18	MUNSK	7.85109E-19	YAWNTD	-9.71191E-17
FYFRIC	-3.39913E-13			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.49395E-13	MUMASC	-1.05866E-18	MUMASK	-9.56247E-20	YAWMAD	1.05919E-17
FXAERO	5.80028E+04			FXN	6.33631E+02						
FXFRIC	6.23151E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.79894E+03			FXMAR	2.79894E+03				
TFAIL	3.60000E+01	THROL	1.70485E+04	THRIL	1.70485E+04	THRIR	1.70485E+04	THROR	1.70485E+04		
		THRO	1.70485E+04					WMD	-2.10455E+02		
TRIM	1.00000E+00	DRTRMD	-3.24570E-16	NSTRMD	-1.07765E-16	DWDEG	-6.22411E-15				
		DRYDDG	0.00000E-01								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	-3.24570E-16	NSTDEG	-1.07765E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.70000E+01	XD	2.38987E+02	YD	8.65407E-01	QD	6.41409E+01	BETADG	-1.76063E-04		
		X	4.73366E+03	Y	1.33775E-01						
		UD	3.97446E+00	VD	-3.41581E-03	VKTAS	1.41497E+02	RDDEG	2.43773E+00	PDDEG	-7.17001E-01
		U	2.38989E+02	V	-7.34330E-04	VKEAS	1.37543E+02	RDEG	9.48021E-01	PDEG	-2.45000E-01
		UTOT	2.38989E+02	VTOT	-7.34330E-04	VKTGS	1.41497E+02	PSIDEG	2.07667E-01	PHIDEG	-4.83393E-02
FZAERO	2.46354E+05			FZN	2.57177E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.19880E+05			FZMAR	1.00757E+05				
FYAERO	-3.76992E+04			FYN	3.51497E+03	MUNSC	-1.63535E-02	MUNSK	-1.01574E-03	YAWNTD	1.63617E-01
FYFRIC	3.76653E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	3.41503E+04	MUMASC	1.75248E-03	MUMASK	1.08850E-04	YAWMAD	-1.75336E-02

FXAERO	4.56195E+04			FXN	6.42943E+02						
FXFRIC	6.15886E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.99699E+03			FXMAR	2.51892E+03				
TFAIL	3.64297E+01	THROL	1.69805E+04	THRIL	1.69805E+04	THRIR	1.69805E+04	THROR	5.28972E+03		
		THRO	1.70133E+04					WMO	-2.17612E+02		
IRIN	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	4.40009E+00				
		DRYDDG	3.03367E+00								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	3.03367E+00	NSTDEG	-1.15719E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.72000E+01	XD	2.39756E+02	YD	1.86687E+00	QO	6.45573E+01	BETADG	-3.81160E-04		
		X	4.78153E+03	Y	4.00003E-01						
		UD	3.78274E+00	VD	-5.19348E-03	VKTAS	1.41956E+02	RDDEG	2.59834E+00	PDDEG	-8.29371E-01
		U	2.39763E+02	V	-1.59491E-03	VKEAS	1.37989E+02	RDEG	1.44524E+00	PDEG	-3.94875E-01
		UTOT	2.39763E+02	VTOT	-1.59491E-03	VKTGS	1.41956E+02	PSIDEG	4.46540E-01	PHIDEG	-1.11984E-01
FZAERO	2.45878E+05			FZN	2.57742E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.25541E+05			FZMAR	9.45629E+04				
FYAERO	-5.80236E+04			FYN	5.44213E+03	MUNSC	-2.48388E-02	MUNSK	-1.46728E-03	YAWNTD	2.48512E-01
FYFRIC	6.39728E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	5.25299E+04	MUMASC	2.67436E-03	MUMASK	1.57980E-04	YAWMAD	-2.67578E-02
FXAERO	4.37042E+04			FXN	6.44355E+02						
FXFRIC	6.14695E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.13853E+03			FXMAR	2.36407E+03				
TFAIL	3.64297E+01	THROL	1.69705E+04	THRIL	1.69705E+04	THRIR	1.69705E+04	THROR	3.47315E+03		
		THRO	1.70133E+04					WMO	-2.18771E+02		
IRIN	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	7.60288E+00				
		DRYDDG	4.00000E+00								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	4.00000E+00	NSTDEG	-1.15719E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.74000E+01	XD	2.40483E+02	YD	3.31034E+00	QO	6.49578E+01	BETADG	-6.71721E-04		
		X	4.82956E+03	Y	9.09959E-01						
		UD	3.65165E+00	VD	-7.06305E-03	VKTAS	1.42396E+02	RDDEG	2.83253E+00	PDDEG	-9.31829E-01
		U	2.40506E+02	V	-2.81942E-03	VKEAS	1.38416E+02	RDEG	1.99091E+00	PDEG	-5.73058E-01
		UTOT	2.40506E+02	VTOT	-2.81942E-03	VKTGS	1.42396E+02	PSIDEG	7.89378E-01	PHIDEG	-2.08446E-01
FZAERO	2.45421E+05			FZN	2.58078E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.32391E+05			FZMAR	8.72218E+04				
FYAERO	-8.10277E+04			FYN	7.64072E+03	MUNSC	-3.40964E-02	MUNSK	-1.91478E-03	YAWNTD	3.41135E-01
FYFRIC	8.09576E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	7.33169E+04	MUMASC	3.68753E-03	MUMASK	2.07084E-04	YAWMAD	-3.68937E-02
FXAERO	4.23911E+04			FXN	6.45195E+02						
FXFRIC	6.13551E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				

		FXMAL	3.30977E+03			FXMAR	2.18054E+03				
TFAIL	3.64297E+01	THROL	1.69610E+04	THRIL	1.69610E+04	THRIR	1.69610E+04	THROR	2.25505E+03		
		THRO	1.70133E+04					WMD	-2.19882E+02		
IRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	1.17226E+01				
		DRYDDG	4.00000E+00								
REACT	0.00000E-01	DRRCTD	0.00000E-01	NSPLTD	0.00000E-01						
		DRDEG	4.00000E+00	NSTDEG	-1.15719E-16						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.76000E+01	XD	2.41174E+02	YD	5.06775E+00	GO	6.53478E+01	BETADG	-1.70059E-02		
		X	4.87772E+03	Y	1.74764E+00						
		UD	3.56119E+00	VD	-7.28792E-01	VKTAS	1.42822E+02	RDDEG	-1.37314E+00	PDDEG	1.09623E+00
		U	2.41227E+02	V	-7.15929E-02	VKEAS	1.38831E+02	RDEG	2.17232E+00	PDEG	-5.54995E-01
		UTOT	2.41227E+02	VTOT	-7.15929E-02	VKTGS	1.42822E+02	PSIDEG	1.22087E+00	PHIDEG	-3.28578E-01
FZAERO	2.44975E+05			FZN	2.58261E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.31741E+05			FZMAR	8.74087E+04				
FYAERO	-8.44128E+04			FYN	4.22515E+02	MUNSC	-3.29302E-01	MUNSK	-1.81207E-02	YAWNTD	3.29467E+00
FYFRIC	7.71769E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	7.67544E+04	MUMASC	5.63822E-03	MUMASK	3.10257E-04	YAWMAD	-5.64104E-02
FXAERO	4.14819E+04			FXN	6.64773E+02						
FXFRIC	6.12439E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	3.29351E+03			FXMAR	2.18522E+03				
TFAIL	3.64297E+01	THROL	1.69517E+04	THRIL	1.69517E+04	THRIR	1.69517E+04	THROR	1.43814E+03		
		THRO	1.70133E+04					WMD	-2.20960E+02		
IRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	1.32536E+01				
REACT	1.00000E+00	DRYDDG	4.00000E+00								
		DRRCTD	8.66562E+00	NSPLTD	2.93984E+00						
		DRDEG	1.26656E+01	NSTDEG	2.93984E+00						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
I	3.78000E+01	XD	2.41846E+02	YD	6.45661E+00	GO	6.57307E+01	BETADG	-6.83448E-02		
		X	4.92603E+03	Y	2.91246E+00						
		UD	3.49798E+00	VD	-1.42717E+00	VKTAS	1.43240E+02	RDDEG	-5.87242E+00	PDDEG	2.74152E+00
		U	2.41932E+02	V	-2.88566E-01	VKEAS	1.39237E+02	RDEG	1.44633E+00	PDEG	-1.68636E-01
		UTOT	2.41932E+02	VTOT	-2.88566E-01	VKTGS	1.43240E+02	PSIDEG	1.59773E+00	PHIDEG	-4.06414E-01
FZAERO	2.44538E+05			FZN	2.58341E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	1.16797E+05			FZMAR	1.01907E+05				
FYAERO	-4.92866E+04			FYN	-1.10349E+04	MUNSC	-6.31128E-01	MUNSK	-3.47294E-02	YAWNTD	6.31443E+00
FYFRIC	3.51168E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	4.61517E+04	MUMASC	9.44565E-03	MUMASK	5.19771E-04	YAWMAD	-9.45037E-02
FXAERO	4.08434E+04			FXN	1.82894E+03						
FXFRIC	6.11346E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.91992E+03			FXMAR	2.54769E+03				

TFAIL	3.64297E+01	THROL	1.69426E+04	THRIL	1.69426E+04	THRIR	1.69426E+04	THROR	9.90178E+02		
		THRO	1.70133E+04					WMO	-2.22016E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	8.62574E+00				
		DRYDDG	4.00000E+00								
REACT	1.00000E+00	DRRCTD	1.80656E+01	NSPLTD	6.13593E+00						
		DRDEG	2.20656E+01	NSTDEG	6.13593E+00						
SKID	0.00000E-01	NSK1	0.00000E-01	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.80000E+01	XD	2.42531E+02	YD	6.84752E+00	GO	6.61091E+01	BETADG	-1.35948E-01		
		X	4.97446E+03	Y	4.25893E+00						
		UD	3.45303E+00	VD	2.01975E-01	VKTAS	1.43652E+02	RDDEG	-1.94760E+00	PDDEG	3.30440E-01
		U	2.42627E+02	V	-5.75649E-01	VKEAS	1.39637E+02	RDEG	1.83480E-01	PDEG	3.42342E-01
		UTOT	2.42627E+02	VTOT	-5.75649E-01	VKTGS	1.43652E+02	PSIDEG	1.75330E+00	PHIDEG	-3.83117E-01
FZAERO	2.44105E+05			FZN	2.58350E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	9.68180E+04			FZMAR	1.21452E+05				
FYAERO	4.52319E+03			FYN	-1.03198E+03	MUNSC	-7.89133E-01	MUNSK	-4.34240E-02	YAWNTD	7.89528E+00
FYFRIC	-2.51787E+03			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-1.48589E+03	MUMASC	1.39187E-02	MUMASK	7.65913E-04	YAWMAD	-1.39257E-01
FXAERO	4.03863E+04			FXN	7.95713E+02						
FXFRIC	6.10263E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.42045E+03			FXMAR	3.03631E+03				
TFAIL	3.64297E+01	THROL	1.69337E+04	THRIL	1.69337E+04	THRIR	1.69337E+04	THROR	5.22515E+02		
		THRO	1.70133E+04					WMO	-2.23057E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	6.11621E-01				
		DRYDDG	5.87137E-01								
REACT	1.00000E+00	DRRCTD	2.74656E+01	NSPLTD	8.00000E+00						
		DRDEG	2.34484E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.82080E+01	XD	2.43217E+02	YD	6.91204E+00	GO	6.64840E+01	BETADG	-1.26864E-01		
		X	5.02304E+03	Y	5.63971E+00						
		UD	3.42033E+00	VD	1.68736E-01	VKTAS	1.44059E+02	RDDEG	-1.41657E+00	PDDEG	5.10950E-01
		U	2.43314E+02	V	-5.38708E-01	VKEAS	1.40033E+02	RDEG	-1.50287E-01	PDEG	4.43614E-01
		UTOT	2.43314E+02	VTOT	-5.38708E-01	VKTGS	1.44059E+02	PSIDEG	1.75485E+00	PHIDEG	-3.04931E-01
FZAERO	2.43676E+05			FZN	2.58314E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	9.25105E+04			FZMAR	1.25334E+05				
FYAERO	1.86779E+04			FYN	-1.02506E+03	MUNSC	-7.84371E-01	MUNSK	-4.31620E-02	YAWNTD	7.64763E+00
FYFRIC	-1.70026E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-1.59775E+04	MUMASC	1.24100E-02	MUMASK	5.82890E-04	YAWMAD	-1.24162E-01
FXAERO	4.00509E+04			FXN	7.94657E+02						
FXFRIC	6.09190E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.31276E+03			FXMAR	3.13335E+03				
TFAIL	3.64297E+01	THROL	1.69249E+04	THRIL	1.69249E+04	THRIR	1.69249E+04	THROR	2.75716E+02		
		THRO	1.70133E+04					WMO	-2.24085E+02		

TRIM	0.000C0E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	-2.08325E+00				
		DRYDDG	-4.80917E-01								
REACT	1.00000E+0C	DRRCTD	3.68656E+C1	NSPLTD	8.00000E+00						
		DRDEG	2.33954E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.000C0E-01				
T	3.84000E+01	XD	2.43904E+02	YD	6.72727E+00	GD	6.68569E+01	BETADG	-1.19228E-01		
		X	5.07175E+C3	Y	7.0C718E+00						
		UD	3.39585E+00	VD	1.42326E-C1	VKTAS	1.44462E+02	RDDEG	-1.02919E+00	PDDEG	3.52362E-01
		U	2.43996E+02	V	-5.07701E-C1	VKEAS	1.40425E+02	RDEG	-3.92766E-01	PDEG	5.30121E-01
		UTOT	2.43956E+02	VTOT	-5.07701E-01	VKTGS	1.44462E+02	PSIDEG	1.69926E+00	PHIDEG	-2.07001E-01
FZAERO	2.43249E+05			FZN	2.58246E+04						
		FZMFL	0.00000E-C1			FZMFR	0.00000E-01				
		FZMAL	8.87450E+04			FZMAR	1.28679E+05				
FYAERO	2.90863E+04			FYN	-1.02006E+03	MUNSC	-7.81040E-01	MUNSK	-4.29787E-02	YAWNTD	7.81430E+00
FYFRIC	-2.76733E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-2.66532E+04	MUMASC	1.12129E-02	MUMASK	6.17015E-04	YAWMAD	-1.12185E-01
FXAERO	3.97971E+04			FXN	7.93790E+02						
FXFRIC	6.08122E+03	FXMFL	0.00000E-C1	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.21863E+C3			FXMAR	3.21698E+03				
TFAIL	3.64297E+01	THROL	1.69161E+C4	THRIL	1.69161E+04	THRIR	1.69161E+04	THROR	1.09942E+02		
		THRO	1.70133E+C4					WMD	-2.25105E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	-4.84680E+00				
		DRYDDG	-1.25685E+C0								
REACT	1.00000E+00	DRRCTD	4.62656E+01	NSPLTD	8.00000E+00						
		DRDEG	2.33405E+C1	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.86000E+01	XD	2.44591E+02	YD	6.35905E+00	GD	6.72285E+01	BETADG	-1.12747E-01		
		X	5.12060E+03	Y	8.31843E+00						
		UD	3.37687E+C0	VD	1.21087E-01	VKTAS	1.44863E+02	RDDEG	-7.49394E-01	PDDEG	2.23543E-01
		U	2.44673E+C2	V	-4.81434E-01	VKEAS	1.40815E+02	RDEG	-5.69111E-01	PDEG	5.87045E-01
		UTOT	2.44673E+02	VTOT	-4.81434E-01	VKTGS	1.44863E+02	PSIDEG	1.60214E+00	PHIDEG	-9.48553E-02
FZAERO	2.42824E+05			FZN	2.58157E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	8.60818E+04			FZMAR	1.30926E+05				
FYAERO	3.67743E+04			FYN	-1.01643E+03	MUNSC	-7.78731E-01	MUNSK	-4.28517E-02	YAWNTD	7.79121E+00
FYFRIC	-3.55721E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-3.45556E+04	MUMASC	1.02518E-02	MUMASK	5.64130E-04	YAWMAD	-1.02569E-01
FXAERO	3.95981E+04			FXN	7.93061E+02						
FXFRIC	6.07059E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.15204E+03			FXMAR	3.27315E+03				
TFAIL	3.64297E+01	THROL	1.69074E+04	THRIL	1.69074E+04	THRIR	1.69074E+04	THROR	-1.51616E+00		
		THRO	1.70133E+04					WMD	-2.26118E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	-7.38284E+00				

		DRYDDG	-1.82116E+00								
REACT	1.00000E+00	DRRCTD	5.56656E+01	NSPLTD	8.00000E+00						
		DRDEG	2.32860E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.88000E+01	XD	2.45277E+02	YD	5.85519E+00	GD	6.75993E+01	BETADG	-1.07199E-01		
		X	5.16959E+03	Y	9.54179E+00						
		UD	3.36158E+00	VD	1.03795E-01	VKTAS	1.45262E+02	RDDEG	-5.47038E-01	PDDEG	1.30336E-01
		U	2.45347E+02	V	-4.59003E-01	VKEAS	1.41202E+02	RDEG	-6.97667E-01	PDEG	6.21919E-01
		UTOT	2.45347E+02	VTOT	-4.59003E-01	VKTGS	1.45262E+02	PSIDEG	1.47479E+00	PHIDEG	2.63513E-02
FZAERO	2.42400E+05			FZN	2.58055E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	8.42493E+04			FZMAR	1.32345E+05				
FYAERO	4.24899E+04			FYN	-1.01378E+03	MUNSC	-7.77150E-01	MUNSK	-4.27646E-02	YAWNTD	7.77539E+00
FYFRIC	-4.14593E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-4.04455E+04	MUMASC	9.47086E-03	MUMASK	5.21158E-04	YAWMAD	-9.47560E-02
FXAERO	3.94357E+04			FXN	7.92434E+02						
FXFRIC	6.05999E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.10623E+03			FXMAR	3.30862E+03				
TFAIL	3.64297E+01	THROL	1.68907E+04	THRIL	1.68987E+04	THRIR	1.68987E+04	THROR	-7.65622E+01		
		THRO	1.70133E+04					WMD	-2.27126E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	-9.72406E+00				
		DRYDDG	-2.23253E+00								
REACT	1.00000E+00	DRRCTD	6.50656E+01	NSPLTD	8.00000E+00						
		DRDEG	2.32317E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.90000E+01	XD	2.45962E+02	YD	5.25038E+00	GD	6.79695E+01	BETADG	-1.02414E-01		
		X	5.21671E+03	Y	1.06538E+01						
		UD	3.34877E+00	VD	8.95489E-02	VKTAS	1.45659E+02	RDDEG	-4.00427E-01	PDDEG	6.35338E-02
		U	2.46018E+02	V	-4.39714E-01	VKEAS	1.41588E+02	RDEG	-7.91629E-01	PDEG	6.40934E-01
		UTOT	2.46018E+02	VTOT	-4.39714E-01	VKTGS	1.45659E+02	PSIDEG	1.32537E+00	PHIDEG	1.52859E-01
FZAERO	2.41976E+05			FZN	2.57943E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	8.30172E+04			FZMAR	1.33165E+05				
FYAERO	4.67727E+04			FYN	-1.01183E+03	MUNSC	-7.76084E-01	MUNSK	-4.27060E-02	YAWNTD	7.76472E+00
FYFRIC	-4.58836E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-4.48718E+04	MUMASC	8.82894E-03	MUMASK	4.85835E-04	YAWMAD	-8.83336E-02
FXAERO	3.92979E+04			FXN	7.91881E+02						
FXFRIC	6.04941E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.07543E+03			FXMAR	3.32912E+03				
TFAIL	3.64297E+01	THROL	1.68901E+04	THRIL	1.68901E+04	THRIR	1.68901E+04	THROR	-1.27198E+02		
		THRO	1.70133E+04					WMD	-2.28130E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	-1.19069E+01				
		DRYDDG	-2.53321E+00								
REACT	1.00000E+00	DRRCTD	7.44656E+01	NSPLTD	8.00000E+00						

		DPDEG	2.31776E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.92000E+01	XD	2.46644E+02	YD	4.56987E+00	QO	6.83395E+01	BETADG	-9.82597E-02		
		X	5.26797E+03	Y	1.16369E+01						
		UD	3.33762E+00	VD	7.76815E-02	VKTAS	1.46055E+02	RDDEG	-2.94051E-01	PDDEG	1.58483E-02
		U	2.46686E+02	V	-4.23026E-01	VKEAS	1.41973E+02	RDEG	-5.60510E-01	PDEG	6.48602E-01
		UTOT	2.46686E+02	VTOT	-4.23026E-01	VKTGS	1.46055E+02	PSIDEG	1.15980E+00	PHIDEG	2.81971E-01
FZAERO	2.41554E+05			FZN	2.57826E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	8.22173E+04			FZMAR	1.33554E+05				
FYAERO	5.00129E+04			FYN	-1.01038E+03	MUNSC	-7.75383E-01	MUNSK	-4.26674E-02	YAWNTD	7.75771E+00
FYFRIC	-4.92417E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-4.82313E+04	MUMASC	8.29546E-03	MUMASK	4.56479E-04	YAWMAD	-8.29961E-02
FXAERO	3.91766E+04			FXN	7.91383E+02						
FXFRIC	6.03885E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.05543E+03			FXMAR	3.33885E+03				
TFAIL	3.64297E+01	THROL	1.68815E+04	THRIL	1.68815E+04	THRIR	1.68815E+04	THROR	-1.61470E+02		
		THRO	1.70133E+04					WMO	-2.29130E+02		
TRIM	0.00000E-01	DRTRMO	-3.46045E-16	NSTRMO	-1.15719E-16	DWDEG	-1.39586E+01				
		DRYDDG	-2.75363E+00								
REACT	1.00000E+00	DRRCTD	8.38656E+01	NSPLTD	8.00000E+00						
		DRDEG	2.31237E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.94000E+01	XD	2.47324E+02	YD	3.83206E+00	QO	6.87092E+01	BETADG	-9.46338E-02		
		X	5.31737E+03	Y	1.24779E+01						
		UD	3.32758E+00	VD	6.76927E-02	VKTAS	1.46450E+02	RDDEG	-2.16792E-01	PDDEG	-1.79942E-02
		U	2.47353E+02	V	-4.08516E-01	VKEAS	1.42357E+02	RDEG	-9.11184E-01	PDEG	6.48192E-01
		UTOT	2.47353E+02	VTOT	-4.08516E-01	VKTGS	1.46450E+02	PSIDEG	9.82375E-01	PHIDEG	4.11763E-01
FZAERO	2.41132E+05			FZN	2.57705E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	8.17280E+04			FZMAR	1.33634E+05				
FYAERO	5.24932E+04			FYN	-1.00927E+03	MUNSC	-7.74938E-01	MUNSK	-4.26429E-02	YAWNTD	7.75326E+00
FYFRIC	-5.18211E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.08118E+04	MUMASC	7.84756E-03	MUMASK	4.31832E-04	YAWMAD	-7.85149E-02
FXAERO	3.90664E+04			FXN	7.90923E+02						
FXFRIC	6.02831E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.04320E+03			FXMAR	3.34085E+03				
TFAIL	3.64297E+01	THROL	1.68729E+04	THRIL	1.68729E+04	THRIR	1.68729E+04	THROR	-1.84771E+02		
		THRO	1.70133E+04					WMO	-2.30128E+02		
TRIM	0.00000E-01	DRTRMO	-3.46045E-16	NSTRMO	-1.15719E-16	DWDEG	-1.58993E+01				
		DRYDDG	-2.91579E+00								
REACT	1.00000E+00	DRRCTD	9.32656E+01	NSPLTD	8.00000E+00						
		DRDEG	2.30700E+01	NSTDEG	8.00000E+00						

SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.96800E+01	XD	-2.47899E+02	YD	3.05038E+00	QQ	6.98769E+01	BETADG	-9.14537E-02		
		Y	5.36690E+03	Y	1.31668E+01						
		UD	3.31829E+00	VD	5.92051E-02	VKTAS	1.46843E+02	RDDEG	-1.60653E-01	PDDEG	-4.17956E-02
		U	2.48018E+02	V	-3.95849E-01	VKEAS	1.42739E+02	RDEG	-9.48630E-01	PDEG	6.42071E-01
		UTOT	2.48018E+02	VTOT	-3.95849E-01	VKTGS	1.46843E+02	PSIDEG	7.96207E-01	PHIDEG	5.40869E-01
FZAERO	2.40711E+05			FZN	2.57581E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	8.14608E+04			FZMAR	1.33492E+05				
FYAERO	5.44188E+04										
FYFRIC	-5.38309E+04			FYN	-1.00841E+03	MUNSC	-7.74674E-01	MUNSK	-4.26284E-02	YAWNTD	7.75061E+00
				FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.28225E+04	MUMASC	7.46799E-03	MUMASK	4.10945E-04	YAWMAD	-7.47173E-02
FXAERO	3.89637E+04			FXN	7.90491E+02						
FXFRIC	6.01778E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.03652E+03			FXMAR	3.33730E+03				
TFAIL	3.64297E+01	THROL	1.68644E+04	THRIL	1.68644E+04	THRIR	1.68644E+04	THROR	-2.00717E+02		
		THRO	1.70133E+04					WMD	-2.31122E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	-1.77441E+01				
		DRYDDG	-3.03562E+00								
REACT	1.00000E+00	DRRCTD	1.02666E+02	NSPLTD	8.00000E+00						
		DRDEG	2.30165E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				
T	3.98000E+01	XD	2.48671E+02	YD	2.23466E+00	QQ	6.94486E+01	BETADG	-9.86534E-02		
		X	5.41657E+03	Y	1.36958E+01						
		UD	3.30950E+00	VD	5.19312E-02	VKTAS	1.47235E+02	RDDEG	-1.19868E-01	PDDEG	-5.83037E-02
		U	2.48680E+02	V	-3.84753E-01	VKEAS	1.43121E+02	RDEG	-9.76465E-01	PDEG	6.31958E-01
		UTOT	2.48680E+02	VTOT	-3.84753E-01	VKTGS	1.47235E+02	PSIDEG	5.03562E-01	PHIDEG	6.68326E-01
FZAERO	2.40290E+05			FZN	2.57456E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	8.13518E+04			FZMAR	1.33193E+05				
FYAERO	5.59393E+04										
FYFRIC	-5.54237E+04			FYN	-1.00772E+03	MUNSC	-7.74534E-01	MUNSK	-4.26207E-02	YAWNTD	7.74921E+00
				FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.44159E+04	MUMASC	7.14361E-03	MUMASK	3.93095E-04	YAWMAD	-7.14718E-02
FXAERO	3.88659E+04			FXN	7.90079E+02						
FXFRIC	6.30726E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.03379E+03			FXMAR	3.32982E+03				
TFAIL	3.64297E+01	THROL	1.68558E+04	THRIL	1.68558E+04	THRIR	1.68558E+04	THROR	-2.11731E+02		
		THRO	1.70133E+04					WMD	-2.32114E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	-1.95043E+01				
		DRYDDG	-3.12469E+00								
REACT	1.00000E+00	DRRCTD	1.12066E+02	NSPLTD	8.00000E+00						
		DRDEG	2.29631E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				

Y	4.00000E+01	XD	2.49338E+02	YD	1.39206E+00	GD	6.98183E+01	BETADG	-8.61793E-02		
		X	5.46637E+03	Y	1.40589E+01						
		UD	3.30106E+00	VD	4.56496E-02	VKTAS	1.47627E+02	RDDEG	-3.02643E-02	PDDEG	-6.95097E-02
		U	2.49341E+02	V	-3.75010E-01	VKEAS	1.43501E+02	RDEG	-9.97320E-01	PDEG	6.19102E-01
		UTOT	2.49341E+02	VTOT	-3.75010E-01	VKTGS	1.47627E+02	PSIDEG	4.06085E-01	PHIDEG	7.93470E-01
FZAERO	2.39870E+05			FZN	2.57329E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	8.13541E+04			FZMAR	1.32783E+05				
FYAERO	5.71638E+04			FYN	-1.00715E+03	MUNSC	-7.74479E-01	MUNSK	-4.26177E-02	YAWNTD	7.74866E+00
FYFRIC	-5.67106E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.57034E+04	MUMASC	6.86430E-03	MUMASK	3.77725E-04	YAWMAD	-6.86773E-02
FXAERO	3.87715E+04			FXN	7.89680E+02						
FXFRIC	5.99674E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.03385E+03			FXMAR	3.31957E+03				
TFAIL	3.64297E+01	THROL	1.68473E+04	THRIL	1.68473E+04	THRIR	1.68473E+04	THROR	-2.19439E+02		
		THRO	1.70133E+04					HMD	-2.33103E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	-2.11886E+01				
		DRYDDG	-3.19142E+00								
REACT	1.00000E+00	DRRCTD	1.21466E+02	NSPLTD	8.00000E+00						
		DRDEG	2.29098E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				
I	0.82000E+01	XD	2.50000E+02	YD	5.27849E-01	GD	7.01881E+01	BETADG	-8.39875E-02		
		X	5.51630E+03	Y	1.42512E+01						
		UD	3.29284E+00	VD	4.01881E-02	VKTAS	1.48017E+02	RDDEG	-5.88170E-02	PDDEG	-7.68609E-02
		U	2.50001E+02	V	-3.66439E-01	VKEAS	1.43881E+02	RDEG	-1.01311E+00	PDEG	6.04410E-01
		UTOT	2.50001E+02	VTOT	-3.66439E-01	VKTGS	1.48017E+02	PSIDEG	2.04970E-01	PHIDEG	9.15845E-01
FZAERO	2.39450E+05			FZN	2.57202E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	8.14338E+04			FZMAR	1.32295E+05				
FYAERO	5.81722E+04			FYN	-1.00666E+03	MUNSC	-7.74481E-01	MUNSK	-4.26178E-02	YAWNTD	7.74868E+00
FYFRIC	-5.77731E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.67665E+04	MUMASC	6.62221E-03	MUMASK	3.64404E-04	YAWMAD	-6.62552E-02
FXAERO	3.86794E+04			FXN	7.89291E+02						
FXFRIC	5.98624E+03	FXMFL	8.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.03584E+03			FXMAR	3.30739E+03				
TFAIL	3.64297E+01	THROL	1.68388E+04	THRIL	1.68388E+04	THRIR	1.68388E+04	THROR	-2.24930E+02		
		THRO	1.70133E+04					HMD	-2.34090E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	-2.28038E+01				
		DRYDDG	-3.24196E+00								
REACT	1.00000E+00	DRRCTD	1.30866E+02	NSPLTD	8.00000E+00						
		DRDEG	2.28567E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				

T	4.04000E+01	XD	2.50658E+02	YD	-3.54152E-01	QQ	7.05579E+01	BETADG	-8.20413E-02		
		X	5.56637E+03	Y	1.42688E+01						
		UD	3.28477E+00	VD	3.54113E-02	VKTAS	1.48407E+02	RODEG	-5.33251E-02	PODEG	-8.14115E-02
		U	2.50658E+02	V	-3.58889E-01	VKEAS	1.44269E+02	RDEG	-1.02524E+00	PDEG	5.88543E-01
		UTOT	2.50658E+02	VTOT	-3.58889E-01	VKTGS	1.48407E+02	PSIDEG	1.06297E-03	PHIDEG	1.03516E+00
FZAERO	2.39030E+05			FZN	2.57075E+04						
		FZMFL	0.00000E-01			FZMFR	0.00000E-01				
		FZMAL	8.15660E+04			FZMAR	1.31756E+05				
FYAERO	5.90227E+04			FYN	-1.00621E+03	MUNSC	-7.74520E-01	MUNSK	-9.26199E-02	YAWNTD	7.74907E+00
FYFRIC	-5.86711E+04			FYMF	0.00000E-01	MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	YAWMFD	0.00000E-01
				FYMA	-5.76649E+04	MUMASC	6.41118E-03	MUMASK	3.52791E-04	YAWMAD	-6.41438E-02
FXAERO	3.85888E+04			FXN	7.88909E+02						
FXFRIC	-5.97574E+03	FXMFL	0.00000E-01	MUR	2.50000E-02	FXMFR	0.00000E-01				
		FXMAL	2.03915E+03			FXMAR	3.29390E+03				
TFAIL	3.64297E+01	THROL	1.68304E+04	THRIL	1.68304E+04	THRIR	1.68304E+04	THROR	-2.28934E+02		
		THRC	1.70133E+04					WMD	-2.35074E+02		
TRIM	0.00000E-01	DRTRMD	-3.46045E-16	NSTRMD	-1.15719E-16	DWDEG	-2.43555E+01				
		DRYDDG	-3.28078E+00								
REACT	1.00000E+00	DRRCTD	1.40266E+02	NSPLTD	8.00000E+00						
		DRDEG	2.28037E+01	NSTDEG	8.00000E+00						
SKID	0.00000E-01	NSK1	1.00000E+00	MFSK1	1.00000E+00	MASK1	0.00000E-01				

**** FINAL VALUES ****

A1	2.35830E+01	A10	9.52355E+04	A11	2.08545E+03	A12	6.96000E+00	A13	4.75000E+00	A2	2.35830E+01
A3	2.20837E+01	A4	2.20837E+01	A5	4.12910E+01	A6	4.37570E+00	A7	8.75000E+00	A8	9.52355E+04
A9	2.08545E+03	ALPHAD	0.00000E-01	B	1.30830E+02	BETA	-1.43179E-03	BETADG	-8.20413E-02	BETAGR	-1.43179E-03
BLC6	0.00000E-01	BLIL	-2.71670E+01	BLIR	2.71670E+01	BLMAL	-1.10500E+01	BLMAR	1.10500E+01	BLMFL	0.00000E-01
BLPFR	0.00000E-01	BLN	0.00000E-01	BLOL	-4.60800E+01	BLOR	4.60800E+01	BMAG	2.00000E+05	BMFG	0.00000E-01
C	2.01868E+01	C1	0.00000E-01	C2	0.00000E-01	C3	0.00000E-01	C4	0.00000E-01	C5	0.00000E-01
C6	0.00000E-01	C7	0.00000E-01	C8	0.00000E-01	C9	0.00000E-01	CD	5.80000E-02	CG	-5.00000E+00
CL	1.59717E-03	CLB	-1.94820E-01	CLDR	2.98000E-02	CLDW	2.48000E-02	CLIFT	4.70000E-01	CLP	0.00000E-01
CLR	0.00000E-01	CM	-6.93162E-02	CM1	-7.45000E-02	CM2	5.18382E-03	CMDERF	-6.87600E-01	CMGEAR	5.00000E-03
CMGREF	-4.60000E-02	CMRF	-1.00000E-02	CMSRF	-1.66170E+00	CN	-4.53728E-02	CN1	7.06153E-04	CN2	-4.60709E-02
CNBRF	1.31790E-01	CNDRRF	-1.16300E-01	CNDW	-2.41000E-03	CNR	-1.93400E-01	CONTIL	-1.00000E+00	CONTIR	-1.00000E+00
CONTOL	-1.88800E+00	CONTOR	1.00000E+00	CONYD	1.00000E+00	CY	7.59399E-02	CYB	-7.44900E-01	CYDR	1.89100E-01
CYDW	0.00000E-01	CYR	8.20000E-02	D1	0.00000E-01	D11	0.00000E-01	D12	0.00000E-01	D2	0.00000E-01
D21	0.00000E-01	D22	0.00000E-01	D3	3.96163E+06	D31	3.96163E+06	D32	0.00000E-01	D4	5.48196E+06
D41	5.48196E+06	D42	0.00000E-01	D5	-4.73253E+07	D6	6.56859E+06	D7	0.00000E-01	D8	0.00000E-01
D9	0.00000E-01	DE	1.57066E-01	DEN1	7.15019E+04	DEN2	7.15019E+04	DETOD	9.00000E+00	DNWSHD	-2.00000E+00
DR	3.97971E-01	DRAG	1.16734E+04	DRDEG	2.28037E+01	DRLEFT	1.00000E+00	DRM1	0.00000E-01	DRMD	2.28037E+01
DRPLT	2.44792E+00	DRPLTD	1.40266E+02	DRRCT	2.44792E+00	DRRCTD	1.40266E+02	DRRITE	0.00000E-01	DRRTM	8.20244E-01
DRRTMD	4.70000E+01	DRTRIM	-6.03918E-18	DRTRMD	-3.46045E-16	DRYD	-5.72561E-02	DRYD1	-3.28078E+00	DRYDDG	-3.28078E+00
DRYDMD	4.00000E+00	DT	2.00000E-01	DT1	1.00000E+00	DT2	2.00000E-01	DTMAX	1.00000E+00	DTMIN	1.00000E-02
DW	-4.25052E-01	DWDEG	-2.43555E+01	DWM	1.71030E+00	DWMD	9.80000E+01	E1	0.00000E-01	E2	0.00000E-01
E3	3.96163E+06	E4	5.48196E+06	FAC	1.00000E+00	FAIL	3.97031E+00	FALSE	0.00000E-01	FRAC1	-2.97572E-02
FRAC2	0.00000E-01	FRAC3	0.00000E-01	FSCG	6.95410E+01	FSCGRF	7.05500E+01	FSHT	1.31940E+02	FSIL	5.18330E+01
FSIR	5.18330E+01	FSMAL	7.39167E+01	FSMAR	7.39167E+01	FSMFL	0.00000E-01	FSMFR	0.00000E-01	FSN	2.82500E+01
FSOL	5.18330E+01	FSOR	5.18330E+01	FSVT	1.27550E+02	FXAERO	3.85888E+04	FXFRIC	5.97574E+03	FXMAL	2.03915E+03
FXMAR	3.29390E+03	FXMFL	0.00000E-01	FXMFR	0.00000E-01	FXN	7.88909E+02	FYAER1	5.90227E+04	FYAERO	5.90227E+04
FYFRIC	-5.86711E+04	FYMA	-5.76649E+04	FYMAA	-5.13171E+04	FYMAB	-5.76649E+04	FYMAIN	-5.26847E+04	FYMASK	7.52561E+01
FYMF	0.00000E-01	FYMFA	0.00000E-01	FYMFB	0.00000E-01	FYMFSK	0.00000E-01	FYN	-1.00621E+03	FYN1	-1.09565E+03
FYNA	-2.62490E+04	FYNB	-2.62490E+04	FYNOSE	-6.33802E+03	FYNSKD	-1.09565E+03	FZAERO	2.39030E+05	FZM	2.13322E+05
FZMA	2.13322E+05	FZMAL	8.15660E+04	FZMAR	1.31756E+05	FZMAR1	1.06661E+05	FZMAR2	2.39549E+03	FZMAR3	2.26995E+04
FZMF	0.00000E-01	FZMF1	2.57075E+04	FZMFL	0.00000E-01	FZMFR	0.00000E-01	FZMFR1	0.00000E-01	FZMFR2	0.00000E-01
FZMFR3	0.00000E-01	FZN	2.57075E+04	FZNO	2.57075E+04	G	3.22000E+01	GAINNT	1.10000E+01	GAINRT	1.50000E+01
GAINWB	-1.50000E+01	GAINWP	-1.50000E+01	GAINYB	0.00000E-01	GAINYP	0.00000E-01	GAINYR	5.20000E+00	IED	0.00000E-01
IENG	0.00000E-01	ILFAIL	0.00000E-01	IRFAIL	0.00000E-01	IXX	3.76900E+06	IZZ	8.92100E+06	KMAG	1.20000E+04
KMFG	0.00000E-01	L1	4.56667E+01	L2	4.56667E+01	LCVFL	1.00000E+00	LCVFY	1.00000E+00	LCVFYN	1.00000E+00
LCVMF	0.00000E-01	LCVNG	1.00000E+00	LCVRN	1.00000E+00	LEN	4.56667E+01	LIFT	8.06705E+04	LWM1	0.00000E-01
LWM2	-1.04592E+06	M	9.92857E+03	M1	0.00000E-01	M2	0.00000E-01	M3	0.00000E-01	M4	0.00000E-01
MAFAC	8.01798E-03	MAFYFC	1.00000E+00	MASK	0.00000E-01	MASK1	0.00000E-01	MASKFC	0.00000E-01	MCG1	0.00000E-01
MCG2	1.47378E+05	MFFAC	0.00000E-01	MFFYFC	0.00000E-01	MFSK	1.00000E+00	MFSK1	1.00000E+00	MFSKFC	1.00000E+00
MMAG	0.00000E-01	MMAG1	0.00000E-01	MMAG2	0.00000E-01	MMFG	0.00000E-01	MMFG1	5.49637E+05	MTHRI	1.59889E+05
MTHRIY	0.00000E-01	MTHRO	1.15546E+05	MTHROY	0.00000E-01	MUMASC	6.41118E-03	MUMASK	3.52791E-04	MUMAX	7.99600E-01
MUMFSC	0.00000E-01	MUMFSK	0.00000E-01	MUNSC	-7.74520E-01	MUNSK	-4.26199E-02	MUR	2.50000E-02	MUR1	2.50000E-02
MUROLL	2.50000E-02	MUSIDE	4.40000E-02	NFAC	-9.68634E-01	NFYFAC	0.00000E-01	NM	1.39616E-01	NMASK	-1.00000E+00
NMASK1	-1.00000E+00	NMD	8.00000E+00	NMFSK	0.00000E-01	NMFSK1	0.00000E-01	NNSK	0.00000E-01	NNSK1	0.00000E-01
NROLL	0.00000E-01	NSK	1.00000E+00	NSK1	1.00000E+00	NSKFAC	1.00000E+00	NSPLTD	9.00000E+00	NST	1.39616E-01
NST1	1.39616E-01	NST2	-4.37923E-03	NSTDEG	8.00000E+00	NSTOP	-1.00000E+00	NSTOPG	-1.00000E+00	NSTPL1	8.44066E-01
NSTPLT	1.39616E-01	NSTRAT	2.87758E-01	NSTRMD	-1.15719E-16	NSTRT	2.49564E-01	NSTRTD	1.43000E+01	NSTTR1	-2.01953E-18
NSTTRM	-2.01953E-18	NTAU	0.00000E-01	NWIND	0.00000E-01	OLFAIL	0.00000E-01	ORFAIL	1.00000E+00	P	1.02713E-02
P1A	0.00000E-01	P1F	0.00000E-01	P2A	0.00000E-01	P2F	0.00000E-01	P3A	1.66014E+04	P3F	0.00000E-01
P4A	3.36608E+04	P4F	0.00000E-01	P5A	-2.39030E+05	P5F	0.00000E-01	P6A	1.47378E+05	P6F	0.00000E-01
P7A	0.00000E-01	P7F	0.00000E-01	P8A	0.00000E-01	P8F	0.00000E-01	P9A	0.00000E-01	P9F	0.00000E-01
PD	-1.42879E-03	PD1	3.58713E+04	PD10	0.00000E-01	PD11	0.00000E-01	PD12	0.00000E-01	PD13	0.00000E-01
PD14	-1.41593E+04	PD15	8.80437E+03	PD2	0.00000E-01	PD3	0.00000E-01	PD4	9.01305E+05	PD5	-1.45590E+06
PD6	0.00000E-01	PD7	0.00000E-01	PD8	5.04568E+05	PD9	8.80437E+03	PDDEG	-8.14115E-02	PDEG	5.86543E-01
PDRRT	8.20244E-01	PHI	1.80655E-02	PHIDEG	1.03516E+00	PRT	1.00000E+00	PSI	1.89001E-05	PSIDEG	1.08297E-03
Q0	7.05579E+01	R	-1.78925E-02	RAMP	1.00000E+00	RCR	2.30000E+01	RD	-9.30631E-04	RD1	-1.01904E+06
RD10	7.75544E+05	RD11	4.57231E+05	RD12	-4.57231E+05	RD13	1.05493E+04	RD14	-9.06260E+05	RD15	7.99958E+05
RD2	-8.15476E+04	RD3	0.00000E-01	RD4	2.52324E+05	RD5	0.00000E-01	RD6	0.00000E-01	RD7	0.00000E-01
RD8	3.63976E+04	RD9	-2.25326E+04	RDDEG	-5.33251E-02	RDEG	-1.02524E+00	RDNS	1.00000E+00	REACT	1.00000E+00
RHO	2.24608E-03	RHOO	2.37700E-03	RM1	0.00000E-01	RM2	0.00000E-01	RMF1	0.00000E-01	RMF2	0.00000E-01

RMFS	0.00000E-01	ROLL	1.00000E+00	S	2.43300E+03	SKID	0.00000E-01	STAB	-6.80628E-02	STBTOD	-1.90000E+00
STOP	0.00000E-01	STOPG	0.00000E-01	STRT	2.49564E-01	SUM1	0.00000E-01	SUM2	5.02003E+07	T	4.04000E+01
TAU	5.00000E-01	TDIFF	1.00000E+00	TFAC	1.00000E+00	TFAC1	1.00000E+00	TFAIL	3.64297E+01	THR	1.68304E+04
THR0	1.2C133E+04	THR1	0.00000E-01	THRAMP	0.00000E-01	THRF	-2.28934E+02	THRIL	1.68304E+04	THRIR	1.68304E+04
THROL	1.68304E+04	THROR	-2.28934E+02	THRUST	5.02622E+04	TRIM	0.00000E-01	TRUE	-1.00000E+00	TWIND	0.00000E-01
TXIM1	0.00000E-01	TXIM2	-1.59888E-05	TXOM1	0.00000E-01	TXOM2	-1.18546E-05	TXW	0.00000E-01	TYIM1	0.00000E-01
TYIM2	0.00000E-01	TYOM1	0.00000E-01	TYOM2	0.00000E-01	U	2.50658E+02	UD	3.28477E+00	UTOT	2.50658E+02
V	-3.58889E-01	VD	3.54113E-02	VKEAS	1.44259E+02	VKFAIL	1.40000E+02	VKLO	4.98955E+02	VKROT	1.80000E+02
VKST	0.00000E-01	VKSTOP	4.98955E+02	VKSTXW	0.00000E-01	VKTAS	1.48407E+02	VKTGS	1.48407E+02	VKXW	0.00000E-01
VTAS	2.50659E+02	VTGS	2.50659E+02	VTOT	-3.58889E-01	VXW	0.00000E-01	WLCG	1.60600E+01	WLGR	7.31000E+00
WLIL	1.20600E+01	WLIR	1.20600E+01	WLOL	1.42700E+01	WLOR	1.42700E+01	WMO	-2.35074E+02	WMO1	0.00000E-01
WT	3.18700E+05	X	5.66637E+03	XD	-2.50658E+02	Y	1.42688E+01	YAWMA	-1.11944E-03	YAWMAD	-6.41438E-02
YAWMF	0.00000E-01	YAWMFD	0.00000E-01	YAWNT	1.35237E-01	YAWNTD	7.74907E+00	YD	-3.54152E-01		

*** INTEGRATION ERROR TOLERANCE FAILURE COUNTS ***

PSI	1937	PHI	179	X	7	Y	1436	DRRCT	0	NSTPL1	0	U	7	P	1825
R	2305	V	1735												

REFERENCES

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